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Contributions.

Locomotives for Suburban Service.

NEW YORK, April 28.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have read with much interest the letter of "Railroad President" in your issue of April 23. The views are in line with thoughts that have been running through my head for some years, and I have planned just such an engine as the letter calls for. It is a double-ended motor car. The motors are steam, compound, balanced engines affixed to each truck, the trucks being swiveled and can be either four or six-wheeled and coupled, with brakes applied to all wheels, the wheels being 60 in., or for strictly local work 50 in. The valves and valve gear will be such as to enable the cylinder to turn the wheels 350 to 400 revolutions without difficulty.

The boiler will have a grate area of 60 sq. ft. and a heating surface of 3,000 sq. ft., the boiler being a combination water tube and fire tube construction, and so arranged as to consume all gases from soft coal and to make no smoke, and to burn the coal with so little draft as not to lift any coal or cinders from the grate. There will be 1,000 sq. ft. of direct heating surface, each foot of which will be equivalent to 10 ft. of ordinary tube heating surface. There will be no crown or side stays, or flat surfaces; the exhaust will be largely condensed and returned to the water supply tank, and the feed water will be supplied to the boiler at about 200 deg., about 80 per cent. of the exhaust being condensed by air condensers on the roof of the motor car.

The motor will be under control by the engineer, located at either end of the car. The weight on each truck will be about 60,000 lbs. for a motor for heavy local work, and as much lighter as the service may require.

Such a motor can be made to handle six, 40-ton cars, so as to obtain a speed of 60 miles within three-quarters of a mile on a level track, and to do its work on a consumption of 30 lbs. of soft coal per train mile, and will be as noiseless and as clean as an electric locomotive and will cost about one-quarter what an electrical locomotive of equal weight and power would cost, to say nothing of the cost of the track equipment and power plant that would be required with an electric service.

I am strongly of the belief that railroads that are spending large sums for electrical equipment for local service on main lines, are making a great mistake, and the locomotive builders are making a bigger mistake by encouraging it, in allowing the public to think that the limit has been reached in what can be accomplished by steam, while ignoring many well-established facts in connection with steam engineering.

There was never a greater fallacy than that the steam locomotive is necessarily a wasteful machine, and that stationary electrical generating plants are much more economical to operate. On the contrary, the conditions under which a locomotive operates are the most favorable to high efficiency in a steam engine, if properly designed for the work it has to do, and the reasons for this are, that we get a higher ratio of evaporation per square foot of heating surface and per square foot of grate area, than can be obtained on either a stationary or marine boiler, and yet have dry steam. This is due to the constant jar of the engine keeping the water in contact with the heating surfaces and liberating the bubbles of steam as they are formed.

We have no difficulty in getting a horse power on every 1 to 1½ sq. ft. of heating surface in a properly designed locomotive, while the best stationary boilers and marine boilers require 4 to 6 sq. ft., and ordinary stationary practice is to allow 11 sq. ft. On the locomotive we get 30 H. P. to a square foot of grate, while getting 10 lbs. evaporation, from and at 212 degs., and on a good stationary plant we could not expect more than 10 to

12 H. P. per square foot of grate. On a locomotive we have got as high as 1,810 H. P. out of a pair of 20 in. x 24 in. cylinders, a stationary engine of this power would require a pair of 30 in. x 48 in.

It is well known that cylinder condensation is one of the greatest losses the steam engine sustains, and the ordinary loss is 20 to 25 per cent., while at the speed at which the pistons traveled, when the 1,810 H. P. was obtained, the cylinder condensation would not amount to more than 7½ per cent.

We all know that radiation is another great source of loss, and the bigger the boiler and the longer the pipes, the greater will be this loss, so that by getting a great amount of power out of a given sized boiler and engine, we are getting the most economical plant built, in first cost and cost of operation, so long as we do not go beyond the point where the coal is lifted from the grate, and where the gases are passed away at too high a temperature.

All of these advantages we have on the properly designed locomotive or steam motor, while on the electrical motor, the steam engine that generates the electricity is working under the worst conditions for efficiency, either as to the first cost, or cost of operation; for, as we all know, the steam engine, to be economical, must have a moderately constant load which should be nearly a full load, which is the reverse of the conditions on electrical railroad work, and especially on main line work. While the engine, if it had a constant load, might be capable of giving an horse-power on 1½ lbs. of coal, it will be found to be using more than 2½ as an average; in fact, as high as 5 lbs. on the average plant.

The conditions of street car work are much more favorable to economical work than the conditions of main line work, because the street car service has less intervals between time of load, but with the properly designed and constructed locomotive the load is almost constant, as far as the demands on the boiler are concerned, and the engine is either working with a nearly full load, or shut off entirely.

The secret of successful competition of the steam roads with the electrical roads, for local and suburban business, does not lie in the adoption of electricity, but in the adoption of steam motors that meet all the requirements of an electrical motor, and then the running of trains that afford so much better accommodations than can be furnished by the light trolley car, and at such frequent intervals, that one will not have to consult a time-table to know when he can get a train that will take him to the city so much quicker than the trolley car can, as it has to run through public streets, while the steam road runs on its own right of way, where it can make the schedule to suit the capacity of the motor that pulls the train. Such a motor as I have outlined could be safely counted on to take a six-car train and run 30 miles and make thirty stops for passengers in one hour.

GEO. S. STRONG.

The Milk Rate Decision.

The Interstate Commerce Commission has issued the full report of its decision on milk rates to New York City, which was briefly given in the *Railroad Gazette* of March 19, 1897. The case, it will be remembered, was brought by the Milk Producers' Protective Association against the Erie, the Delaware, Lackawanna & Western, the New York, Ontario & Western, the New York Central, the West Shore and the other railroads carrying milk to New York City. The principal complaint was that against the maintenance of a single group rate of 32 cents per can of 40 quarts, from all stations, regardless of distance, this rate applying on points not more than 40 miles from Jersey City, and also from as far away as Hornellsville, on the Erie, 331 miles, and Romulus, on the Lehigh Valley, 335 miles. The Commission ordered a reduction to 23 cents from points within 40 miles, to 26 cents from the 60-mile group, so-called, and to 29 cents from the 90-mile group.

The decision first deals with a number of minor points, holding: (1) The complainant may rightfully bring the proceeding on behalf of itself and of all shippers of milk; (2) the New York, Susquehanna & Western, in bringing milk from points in New York, through New Jersey, to the city of New York, is subject to the Interstate Commerce law; (3) the rates complained of do not violate the long and short haul law; (4) giving passes to interstate milk shippers is unlawful, even if the pass does not provide for an interstate ride; (5) the payment of a commission of 25 per cent. to an individual for developing milk traffic may be extravagant, but the Commission will not interfere, though this unnecessary cost will not excuse unjust rates; (6) the carrying of milk in quart bottles, packed in cases, at the same rate per quart, as in 40-quart cans, is a discrimination in favor of the bottle method, but the Commission does not now order a difference in rates. On the second point the Commission refers to the decision of the Supreme Court in the case of the Lehigh Valley (145 U. S., 194) wherein the traffic of that road from one point in Pennsylvania to another point in the same state, moving through New Jersey, was allowed to be taxed in Pennsylvania so far as the receipts from it arose from service within the state of Pennsylvania. This decision is held not to interfere with the regulation by Congress of traffic passing through two states.

"If the State of Pennsylvania had attempted to regulate the aggregate charge or charges made for the entire transportation through different states, we think the court would have had an entirely different case to consider. The Lackawanna receives freight at New York City, takes it across the river to New Jersey, and through

that State and the State of Pennsylvania to Binghamton, N. Y.; and out of the total distance of about 208 miles less than 15 are within the State of New York. Granting that New York may impose a tax on the gross receipts of the Lackawanna represented by its mileage in New York, on traffic between points in that state, does it follow that New York can also regulate the freight charges and passenger fares of the Lackawanna for the whole distance between New York City and Binghamton, N. Y.? We think not. If neither of the states through which the transportation is conducted has power to regulate the entire transportation or the compensation exacted therefor, it does follow, we think, that such power is vested in the general government. The Lehigh Valley decision is not necessarily in conflict with this view. The Supreme Court called attention in that decision to the fact that the case was one of taxation, and not one of direct regulation. In *Covington & C. Bridge Co. v. Kentucky*, 154 U. S., 204, decided since the Lehigh Valley case, the power of a state to tax, and its power to prescribe a scale of charges for the use of, instrumentalities of interstate commerce, are carefully distinguished."

The Lehigh Valley has a special arrangement with the Farmers' Dairy Despatch and the Lackawanna one with the Produce Despatch. The Erie, in its answer, alleged that the complainants were trying to create a monopoly in favor of a limited class of shippers; that a uniform rate had prevailed for 45 years, and was believed to be more satisfactory to all parties interested; that the business of producing milk, being peculiar and confined to a few localities, requires special encouragement; that the producers at the distant points, relying upon the prevailing custom, have established farms and creameries and will be greatly damaged by a change in rates. The defenses of the other roads were similar, except that the Lehigh Valley already charges lower rates from points in New Jersey to Jersey City (not subject to the Interstate Commerce Commission), and the New York, New Haven & Hartford makes lower rates, from all points, than do the other roads. (The order issued by the Commission does not apply to the New Haven road.)

On the main question the report is very full. The Commission refers to its decision in 1888 in the Howell case, in which the group rates were not interfered with, but at that time the Commission found no injury to the complainant; now the case is different.

In the fifty-five pages of "facts" the Commission has gathered a great mass of information concerning the milk traffic on the roads interested, much of which however, throws but little light on the grounds for the decision. The cans weigh, full, 100 lbs., and empty 20 lbs. The rate includes the return of the empty can. The present rate of 32 cents has prevailed since January, 1890. In 1879 it was 55 cents; in that year it was reduced to 40, and in 1884 was as low as 27½, being restored a year later. The total receipts of milk, cream and condensed milk at New York for 10 years are given in a table taken from the *Milk Reporter*. The supply to New York and vicinity increased from 5½ million cans in 1886 to over 8 million cans in 1895, or 47.3 per cent. The population did not increase quite so fast, so that the milk supply per capita per annum increased 6¼ quarts; that is, from 96.88 in 1886 to 103.13 in 1895. The average yearly prices per quart paid in New York are given for 25 years. Since 1884 they have averaged about 2½ cents, exclusive of freight charges. The price varies somewhat with the demand, but, generally speaking, the freight rate is equal to about 25 per cent. of the price paid to producers. Milk carried to Philadelphia, Baltimore, Boston and Chicago is transported under rates graded by distance or in short groups.

Detailed information is given concerning the running of milk trains on the several defendant roads, the speed, the cost of the service, the average receipts per ton per mile, etc. The Ontario carries nearly as much milk as the Erie, but at greater cost, because its milk trains have to travel three times as many miles, but the rate is the same. The Lackawanna, in 1894, brought in about the same amount as the Erie, yet it ran four trains while the Erie ran only two. Grain and feed from Chicago cost more east of Port Jervis than west of there, and similar differences exist on most of the other roads. A table is given showing that rates from the milk farms to New York on potatoes, butter, fruit, etc., vary somewhat in proportion to distance, and they are lower than on milk.

Some New York dealers formerly buying milk in Orange County, N. Y., have gone farther west, and the reasons given for this are: (1) The distant farmers will accept a lower price; (2) a growing demand which could not have been met by Orange County; (3) disagreement with the near by farmers about prices; (4) the practice of these farmers in feeding brewers' grain to their cows. But the development of the far-off region has been carried far beyond this natural demand, and a total supply made possible much greater than the requirements of the cities. This has been accomplished "through extension of the uniform rate for considerable distances from time to time, through the free icing of milk in transportation by most of the carriers, through solicitations by railway agents, and through facilities and other material aid to dealers and others in the erection of creameries in the more distant localities or the occupation of those already built. This extension of the total milk traffic under a uniform rate charged by all the defendant lines has been without regard to greater cost of transportation from the more distant region or to any difference in cost of service on the several lines from their respective fields of supply." On the other hand, it is claimed that Orange County could have produced more milk if the railroads had not given such low rates to the distant points.

"Economically conducted, milk transportation on all the lines is highly profitable."

To support the main point in the decision the view of the Commission in the Eau Claire lumber case is quoted; also that in the case of Newland vs. Northern Pacific in which a group rate on grain for stations 200 miles apart was condemned. The Commission then said that "the practice of making one rate on the same product over a very large district, and thus equalizing the burdens of transportation to the same market, is only justifiable under special and exceptional circumstances."

As the shipments of milk are practically limited to the amount of daily consumption, "the duty of the carriers

freight house has a frontage of 32 ft. on Front street and is 611 ft. 4 in. long. In the opening between the two houses are four stub-tracks lying in 12 ft. spaces between 6 ft. platforms, three in number. Next to each building is a platform 8 ft. wide; these platforms are joined at the Front street ends by means of a 12-ft. platform; they are also extended more than 100 ft. beyond the east end of the freight houses. The stub-tracks have a capacity of 76 cars.

The storage tracks for supplying the freight house tracks are east of the freight houses, and have suitable

place the cars properly upon the various tracks. The total capacity of the yard is 768 cars.

For the handling of stock, pens and chutes are provided at the east end of driveway No. 3. For the proper handling of heavy agricultural and other machinery there is an uncovered platform, 58 ft. wide \times 100 ft. long, at the east end of the inbound freight house; a similar platform, 40 ft. wide \times 103 ft. long, is provided at the east end of the outbound freight house, which is used for loading and unloading machinery and cotton.

Up to the time of the construction of these new ter-

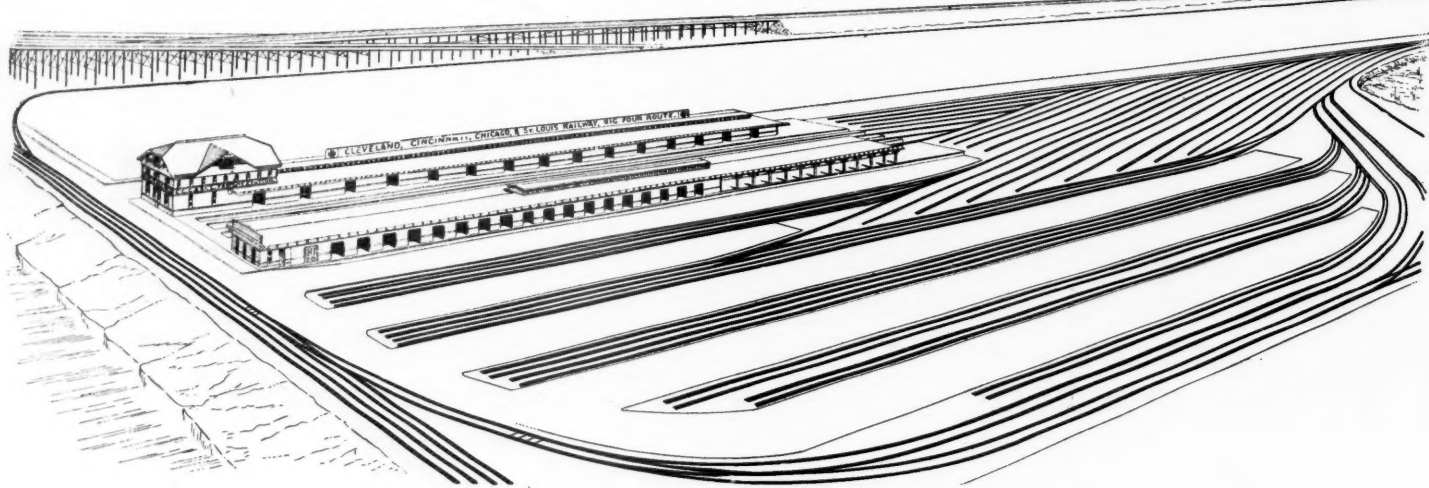


Fig. 1.—General View of New Freight Terminals at East St. Louis—C., C., C. & St. L. Ry.

is to establish rates which will not deprive producers more favorably situated with reference to and dependent upon that market of part of their trade in a limited traffic, or prevent them from supplying their share of the greater demand due to increase in the city population or in consumption per capita. Furnishing an extra perishable article like milk in no greater quantities than is required for daily use in a given city is a business which falls naturally to those producers nearest to the city who are able to provide the needed supply."

The railroads, by freight rates, have overcome natural disadvantages of the more distant producers, and producers nearer the market have been denied recognition of their more favorable location. The latter have participated but little in the 47 per cent. increase in the New York supply during the last 10 years. But, without regard to this, "the right of the nearby producers to a rate reasonable in itself must be upheld." Considering the constancy of the traffic, charging 25 per cent. of the value of the milk for 50 to 90 miles seems clearly excessive. The revenue on milk per ton is four or five times that received on freight generally and the 32-cent rate "must be reasonably profitable for the extreme distances."

Slight modifications of the general order are made, to provide for peculiar circumstances at certain stations and on certain branch lines.

New Freight Terminals at East St. Louis—Cleveland, Cincinnati, Chicago & St. Louis Railway.

It will be remembered that a cyclone which visited St. Louis in 1896 destroyed the freight houses of the Cleveland, Cincinnati, Chicago & St. Louis Railway at East

connections to permit of the prompt handling of cars in and out of the house tracks. The storage tracks have a capacity of 65 cars. For the transfer of loads from one car to another a set of four tracks is provided, two high and two low. These are immediately east of the inbound freight house and have a capacity of 42 cars.

The yard for bulk freight team delivery, with suitable driveways to the various bulking tracks, occupies the space between the outbound freight house and the interchange tracks, which latter are along the south boundary line of the property. The five driveways in this yard are paved with brick and are 35 ft. wide from curb line to curb line; the space between the curb lines of any two driveways is 22 ft., thus allowing room for two tracks 12 ft. center to center with 5 ft. from the center line of each track to the curb line. This bulking yard has a capacity of 161 cars and, as will be seen, is easily reached by teams from Front street.

South and east of the freight houses lies the working yard proper, consisting of 10 tracks. These tracks are spurs spaced 13 ft. center to center, and are connected at their east end by a ladder track. It will be noticed that these tracks are of equal length, each having a capacity of 35 cars, this being the maximum train length on the west end of the St. Louis division. The total capacity of the working yard is 350 cars.

In laying out this yard it was necessary in order to make use of the whole of the available property to fill in part of the Old Mississippi Slough, and to place a ladder track along and parallel with Boggy avenue; it was also necessary to place the working yard at an angle of about 10 deg. with Boggy avenue.

The interchange tracks, one for delivery and one for the receipt of cars from the East St. Louis Connecting

minerals the old Mississippi Slough was crossed upon a pile trestle with two tracks, and the yards and freight houses occupied the space bounded by the Slough, Front street, Boggy avenue and the south property line. In the present arrangement the ladders for the several yards come together east of the Slough, and become double track upon reaching the crossing of Cahokia Creek. This double track passes out through East St. Louis and joins the main line of the C., C., C. & St. L. Ry. about $\frac{1}{4}$ mile from the Cahokia Creek bridge.

The perspective view shows in general the arrangement as given on the plan, together with the east approach to the Eads Bridge over the Mississippi River, which lies just to the northward of the terminals of the Louisville & Nashville Railroad, which are immediately north of Boggy avenue.

Fig. 3 shows a longitudinal and cross section of the inbound freight house. It will be seen that the construction is very simple. Upon concrete footings, foundation walls varying in thickness and composed of vitrified brick are built up to a point 3 ft. 2 in. above the roadway on the Boggy avenue side and 3 ft. above the top of the rail on the south side. The wall on the street side is capped with a 9 in. \times 12 in. timber to which is bolted a 12 in. \times 12 in. timber which forms a bumper and protects the wall from heavy wagons. The track side is capped with a 12 in. \times 12 in. timber anchored to the brick foundation walls with 1 in. anchor bolts placed 4 ft. center to center. On the street side the foundation walls are corbelled out to better support the bumper timbers. On the center line of the building is a row of posts 18 ft. 6 in. center to center, which together with the side posts support the rafters and roof. The roof construction is the ordinary purlin and stirrup type,

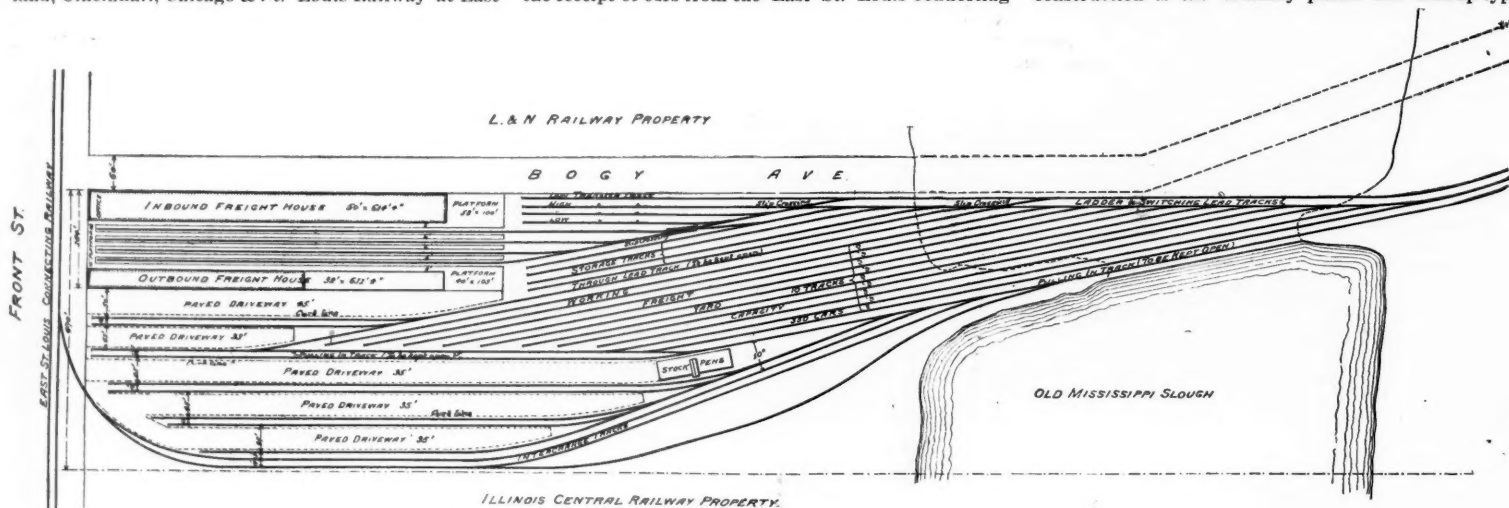


Fig. 2.—Plan of New Freight Terminals at East St. Louis—C., C., C. & St. L. Ry.

St. Louis. Since that time new freight houses have been built and the tracks in the adjoining yards have been rearranged.

Fig. 1 shows a perspective view of the new freight houses and yards, while Fig. 2 is a plan showing the general arrangement. The inbound freight house stands at the corner of Front street and Boggy avenue, and is 50 ft. wide, measured along Front street, and 614 ft. 4 in. long on the Boggy avenue side. The outbound freight house lies south of the inbound freight house and parallel to it with a space of 82 ft. between. The outbound

Railway, lies along the south line, dividing the property of the C., C., C. & St. L. Ry. from the Illinois Central R. R. These two tracks have together a capacity of 74 cars.

To permit trains bound into the terminals to be properly handled and taken care of, a "pulling-in track" is provided at the south of the working yard and a "through lead track" is provided at the north of the yard; these two tracks are kept open at all times. The trains are brought in on the "pulling-in track" and the engines are cut off and pass out on the "through lead track"; the yard engines then break up the train and

while the roof covering is tar and gravel laid on $\frac{1}{4}$ -in. grooved and tongued boards. To better provide light inside the house, a monitor top 20 ft. wide extends along the building from the office portion to the east end and is provided with swinging sash on both sides. The floor consists of $\frac{1}{2}$ -in. \times 4 in. maple lumber, with square edges laid diagonally upon $\frac{1}{4}$ -in. \times 6 in. grooved and tongued common pine flooring coated with tar; both floors rest upon 6-in. \times 8-in. oak joists embedded in cinders which cover the earth filling. One important feature of the floor is that it has a slope of 1 ft. in 100 ft.

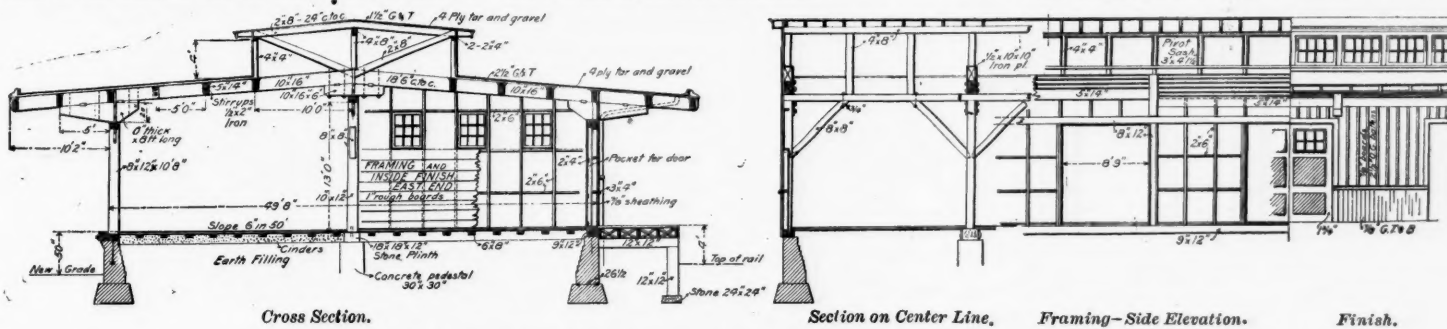
in the direction of the heaviest trucking, which greatly facilitates the handling of freight inside the house. There are three floor scales, each 7 ft. x 9 ft. spaced about 180 ft. apart. Wagon scales are placed alongside of the offices in Boggy avenue, with the scale beams inside the building. The offices are at the west end of the inbound freight house, and occupy a two-story building.

Fig. 4 gives a longitudinal and cross section of the outbound freight house. The general construction is similar to that of the inbound freight house, except that the

bottom of the river, and the north end on its pier, with the trusses standing upright and about parallel with each other. There were no wheel marks on the south span showing derailment, except just over the pier. There were some marks on the right-hand short panel post of the south span, probably made by the last car which fell over the skew pier. The train crew state that they do not know that the train was broken in two going on the bridge. The conductor and head brakeman were on the engine, the second brakeman near the rear of the train and the flagman in the caboose.

few college men in the railroad service. In fact, the great organizers and leaders in railroad development have been to a large extent self-made men, who by force of their individuality and ability seized the opportunity, and built up the railroad systems of to-day. Those self-made "practical" men have so impressed themselves upon the railroad business that it has been customary in many parts of the country to consider a college-educated man as unfit to enter railroad service. Let us give full honor to those who have done such magnificent work, but let us look at the field as it is to-day, and see what opportunities there may be for the college-trained man.

Next to agriculture, the railroad interest is the largest



other colleges will add a regular course of four years' study in special railroad subjects, and the railroad profession will be recognized just as law and medicine are to-day. Such a course of study would not be expected to turn out practical railroad men, but it would turn out men possessed of special knowledge, which would make it easier for them to rise in the railroad profession than for those without such training.

Metal Car Truck—American Steel Foundry Company.

The accompanying illustrations show the design of the metal trucks to be furnished by the American Steel Foundry Company, Granite City, Ill., for use under 10 of the 100,000-lb. capacity hopper cars of the Pittsburgh, Bessemer & Lake Erie R. R. While this truck is of the rigid diamond type it has a number of interesting features beside being adapted to the carrying of exceptionally heavy loads.

The upper arch bar of the frame is a 1½ in. × 5 in. wrought-iron plate, the lower arch bar being 1½ in. × 5 in., while the tie bar is ¾ in. × 5 in. wrought iron. In calculating the strength of this frame the car body was taken to weigh 40,000 lbs., the load carried 100,000 lbs., and the limit of overloading 10 per cent. The load on one journal is, therefore, 18,750 lbs., producing a total stress in the upper arch bar of 31,500 lbs., in the lower 30,000 lbs., and in the tie bar 6,250 lbs. On the assumption that the metal has an available working strength of 35,000 lbs. per square inch in tension and 33,000 lbs. per square inch in compression, the factor of safety provided in the upper arch bar is 6.5, in the lower 5, and in the tie bar 13.5; it becomes necessary to use a large factor of safety in designing the tie bar, as the maximum stresses arising in this member are produced by irregularities in the track and cannot be definitely accounted for in a calculation based alone on static loads. The calculated maximum strengths of the various members of the frame become, with the load applied at the pedestal, upper arch bar, 123,750 lbs., lower arch bar, 93,887 lbs., and the tie bar, 256,666 lbs.

The bolster is 13 in. wide, 11 in. deep at the center and 4 in. deep at the ends, and is made of basic cast steel, which has a tensile strength of about 60,000 lbs. per square inch and is very tough. The center plate and side bearings, together with the upper spring seats, are cast

toward the ends, where it becomes ½ in. wide × 1½ in. deep. The thickness of the top plate proper is ¾ in., while the sides and end plates are ½ in. thick.

No spring plank is used, but instead the lower spring seat and bolster columns are formed of a single steel casting, which is held between the arch bars by means of 1¼-in. column bolts. The bolster rests at either end on a nest of four double coil springs and in addition to these springs a single double coil spring is used directly over each journal box.

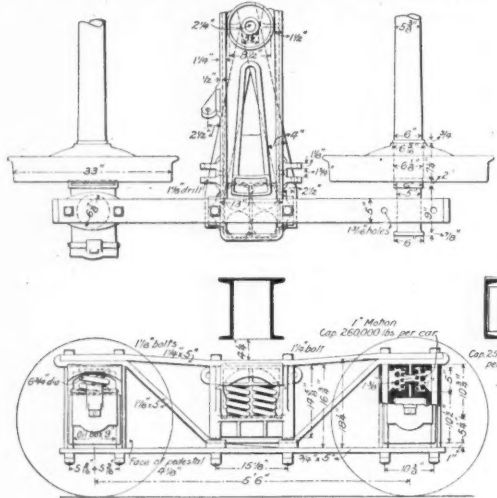
The side frames are joined by two ¾-in. × 4-in. wrought-iron tie bars which cross at the center and are there bolted together; the ends of the tie bars are upset and held between the lower members of the side frame, forming a rigid construction. The only fastenings used in the truck, beside the rivets holding the brake hanger castings, are the column and pedestal bolts.

In the table is given the name, number of pieces, dimensions and material of each part entering into the construction of the truck, including wheels, axles and journal boxes, making a total weight of 6,975.5 lbs. Deducting the weight of the springs, wheels, axles and journal boxes makes the weight of the truck frame proper 2,145.5 lbs.

We are indebted to Mr. Edward F. Goltra, Vice-President and General Manager of the American Steel Foundry Company, for the drawing and information furnished.

An Improved Gondola Car.

Small changes are continually being made in the details of cars, and quite often a slight alteration in design greatly increases the value of the car. Mr. E. S. Hart, Manager of the Rodger Ballast Car Co., Chicago, has designed an improved arrangement for attaching the sides to gondola, coke and similar cars by which the space, usually occupied by the stakes and pockets, is available for loading, thus increasing the inside width of the car about 13 in.



The American Steel Foundry Co.'s Metal Truck for the Carnegie Steel Co.'s Hopper Cars.

with the bolster. The bolster is strengthened under the center plate by webs, and along both the upper and lower edges there is an extra thickness of metal provided to give additional strength; around the top edge the metal is 1½ in. wide × 1½ in. deep; the lower edge is 1½ in. wide × 2¼ in. deep, at the center and tapers

Fig. 1 shows the usual form of construction, where the sides are held in place by means of oak stakes fitting into outside stake pockets, while Fig. 2 is the new form of construction. It will be noticed from Fig. 2 that the side sills are moved out on a line with the stake pockets of the ordinary construction and the sides of the car are

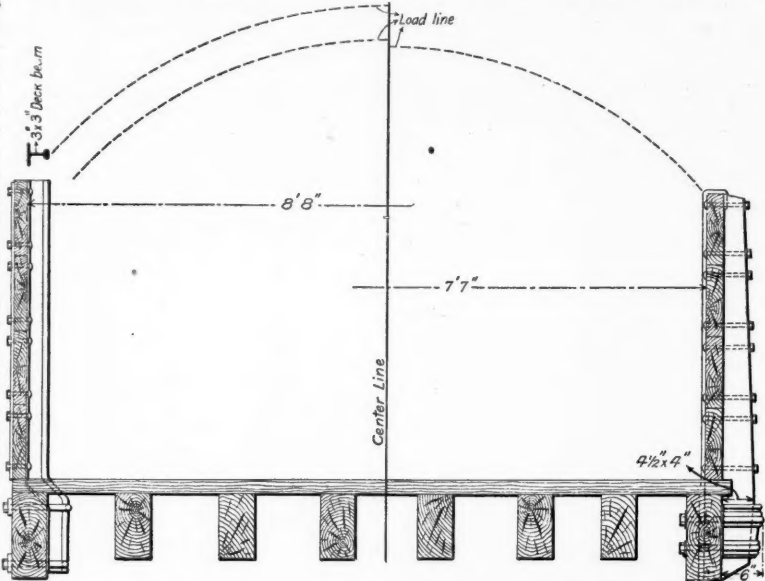


Fig. 2

Fig. 1.

An Improved Gondola Car.

bolts which hold the steel stakes is made from the outside of the cars, and the deck beams are so shaped that when the bolts are properly tightened the stakes are in a perpendicular position. Holes are drilled through the base of the deck beams for the side plank bolts while on the outside of the planks opposite each stake is an iron band ¾ in. × 2¼ in. which assists in tying the planks together. It, therefore, becomes unnecessary to use side tie straps or side tie rods for joining the sills and side planks, which avoids the loss of material by boring the vertical holes through the side sills. The stakes are prevented from moving upward by the recesses which hold the U bolts. The flooring is notched around the stakes so there are no openings in the floor.

A comparative test of a white oak stake 4 in. × 4½ in. attached to a sill by a stake pocket, as shown in Fig. 1, and a 3-in. deck beam stake attached to the sill, as shown in Fig. 2, resulted in a 5-in. deflection of the top of the oak stake which broke at the stake pocket; double the load produced a deflection in the steel stake of less than 3 in. with no permanent set or injury. It is therefore estimated that a car body having 14 steel stakes will have at least 50 per cent. greater strength and stiffness than a car body with 18 stakes of oak as now put on.

A gondola car, built as shown in Fig. 1, 34 ft. long with 9 ft. clearance and sides 42 in. high, will have a capacity, within the load line, of 1,134.12 cu. ft., equivalent to 30 tons of coal. A similar car, built as shown in Fig. 2, will have a capacity of 1,336.75 cu. ft., or a coal capacity of 35 tons. It is, therefore, evident that the same load of coal can be carried in six of the cars shown in Fig. 2 as would require seven cars similar to Fig. 1; or if it were desired to carry but 30 tons per car, the car Fig. 2 need be made but 29 ft. long, which would considerably reduce the cost of building. The cost of the construction of 34-ft. cars by the two methods as shown is practically the same.

Alabama Railroad Commissioners' Report.

The Railroad Commissioners of Alabama, Henry R. Shorter, Harvey E. Jones and Ross C. Smith, have issued the 16th annual report of the board. It is dated Oct. 9, 1896, and the statistics are for the year ending June 30. The length of new railroad built in the state during the fiscal year was 13 miles, and the total length of road in the state on June 30, according to the reports returned by the companies, was 3,479 miles. Besides this there are 103 miles of road of companies failing to report, or excused, mostly coal railroads, and 42 miles of railroad classed as idle.

The annual reports of the companies are given in full, together with the usual summaries, but these latter show the operations throughout the whole of the lines of the companies reporting, including business outside of Alabama.

The report says that complaints are made of non-observance of the law requiring separate passenger accommodations for white and colored persons. The Commissioners have urged the railroads to strictly enforce the law, reminding them that this is the only way to test the virtue of a law. The provisions of this and other laws have been embodied in placards, which the Commissioners have posted in the passenger stations throughout the state.

Numerous complaints concerning inadequate depot facilities and freight irregularities have been adjusted without the trouble and expense of formal hearings, and the Commissioners "have endeavored to treat every complaint in an impartial spirit." On the subject of freight rates the report says:

At different times freight tariffs have been submitted

LIST OF MATERIAL FOR ONE AMERICAN STEEL TRUCK FOR 100,000-LB. CAPACITY HOPPER CARS.

Pcs.	Name.	Dimensions.	WEIGHT.							Total.
			Wrool. iron.	Basic cast steel.	Mall. iron.	Cast iron.	Nickel steel.	Wood.	Brass.	
1	Bolster			750						750
2	End Pieces			220						220
4	Pedestals			160						160
8	Spings	Penn. "W" 1½ in. & ¾ in. dbl. coil					180			180
2	Cross tie	4 in. × ¾ in. × 84½ in.	144							144
2	Top arch bars	5 in. × 1½ in. × 81 in.	287							287
2	Bot. "	5 in. × 1½ in. × 93 in.	294							294
2	Tie "	5 in. × ¾ in. × 81 in.	172							172
4	Col. bolts	1¼ in. × 2¼ in.	33							33
8	" nuts	1¼ in. × 2¼ in. sq.	12							12
8	Ped. "	1¼ in. × 23 in.	55							55
16	" "	1¼ in. × 2 in. sq.	17							17
4	Wheels	33 in. diam				2,600				2,600
2	Axles	Jr. 5 in. × 9 in.					1,400			1,400
4	Oil boxes				320					320
4	Lids									
4	" springs		14							14
4	" bolts									
4	" keys									
4	Wedges				32					32
4	Bearings							72		72
4	Dust guards							12		12
4	Ped. springs	Dbl. coil 1½ in. and 1 in.					260			260
1	Cross tie bolt	5 in. × 6¼ in. dia.								
1	" nut	¾ in. × 4 in. H. x. Hd.	1.5							1.5
1	" Cotter.									
	Totals		1,029.5	1,130	352	2,600	1,780	12	72	6,975.5

Truck frame only, Weight, 2,145.5 lbs. = 4,291 lbs. per car.



Fig. 1.—Swing Bridge Across the Calumet River, Chicago—C., L. S. & E. Ry.

to us in which an advance in the rates was contemplated, but we have declined to approve those tariffs, as we were impressed that such demands were unreasonable. We regret to report that we have in several cases ascertained that higher rates on some classes have been charged than those approved by the board. We have in such cases directed that the approved rates be restored and that no deviation from the rates on file in our office will be allowed if an advance is made. We believe that corporations should share alike with individuals the burdens of the times. In order that the ruling of the Commissioners in this matter should be made known to all the carriers, we have issued circulars of instruction to the freight department of all railroads and admonished them against future violation of law.

Double Track Swing Bridge Across the Calumet River —Chicago, Lake Shore & Eastern Railway.

The bridge shown by the accompanying illustrations crosses the Calumet River at South Chicago and was built by the Chicago, Lake Shore & Eastern Railway Company, whose road runs through the South Works of the Illinois Steel company, and over whose tracks all deliveries to the latter Company are made. Before this bridge was built, access to these works was difficult and dangerous, owing to the network of tracks and the congested condition of the streets crossed. These tracks were used by a traffic often reaching 2,000 cars a day. A continual decrease in the earnings of the railroad rendered necessary the most economical handling of freight possible, for which reason the President, Mr. W. G. Brimson, and the Board of Directors, decided to make a poling yard on the line of the road in Indiana, about 10 miles distant. This yard is now under construction, and the bridge illustrated was built on the new line.

The Calumet River is 329 ft. wide at this point, and the War Department requires a channel 200 ft. wide and 20 ft. deep. The bridge consists of two approach girder spans and one swing span 246 ft. 6 in. long, center to center of end bearings, permitting two channels 100 ft. wide in the clear on each side of the center pier.

The substructure was built by Messrs. Morris & Wait, general bridge contractors, of St. Paul and Chicago, and consists of first-class masonry laid in Alpha Portland cement. The open caisson method was used in building the piers which rest on piles cut off 16 ft. below Chicago City datum, which is an arbitrary point of zero elevation established by the Trustees of the Illinois and Michigan Canal as the low water mark of Lake Michigan in 1847. The bottom of the caissons consisted of three courses of 12 in. by 12 in. hemlock timber thoroughly drift-bolted and caulked. Masonry constructed of stone obtained from Joliet, Ill., was used up to an elevation of 2 ft. below datum and from this point to 3.5 ft. above datum Portland sandstone quarried at Vigo, Ind., was substituted. The center pier is 39 ft. in diameter

and the coping 40 ft. in diameter with a 6 in. chisel draft.

The superstructure was built by the Edge Moor Bridge Works, Wilmington, Del. Soft steel is used throughout, except for the eyebars and pins, which are of medium steel. The swing bridge was proportioned as a continuous girder, having four points of support, but incapable of transferring sheer across the center panel while the moving load consisted of 4,320 lbs. per lineal foot of track, headed by two 100.5 ton locomotives, this weight including the tenders. These trainloads are actually attained while the locomotives are sufficiently heavy to do the work required of them, as the grades are light.

The swing bridge consists of eight panels, each 27 ft. 2 1/4 in. long, and one center panel 29 ft. long. The trusses are 29 ft. apart, center to center, and 28 ft., 30 ft. and 40 ft. high, center to center, while the steel stringers are spaced 4 ft. each side of the center line of the track. The trusses are carried by a square framework of plate girders 29 ft. long each, which in turn are supported on eight girders radiating from a common center to a circular drum 36 ft. in diameter. In this way a little over one eighth of the load concentrated upon each radial girder is transmitted to the center, and the remainder of the load is transmitted to the drum. The live ring consists of 78 cast-steel wheels, 14 in. in diameter, with 7-in. faces. The ends of the swing bridge are supported, when closed, by wedges operated from the engine-house.

The bridge is operated by an 8 1/2 in. x 13 in. double-reversible engine furnished by the Vulcan Iron Works, Chicago, who also furnished the boiler and all machinery on the engine-house floor.

The engine turns the bridge swinging shafts through a geared equalizer. These in turn drive four pinions meshing with the circular rack below through two other equalizers attached to the circular girder. In this way the stress is so distributed as to reduce the liability of

accident to a minimum. Steel castings are used throughout. The bridge has been in use nearly one year and is operating satisfactorily, on an average of 150 times each day.

This bridge was designed and constructed under the direction of Mr. W. L. Stebbings, Civil and Consulting Engineer, Monadnock Block, Chicago.

Foreign Railroad Notes.

Prussia and the Grand Duchy of Hesse have joined in a sort of copartnership to purchase and work the Lewis of Hesse railroad, which has about 300 miles of road in Hesse, 90 in Prussia, and a little in two other German states. Hesse is too small to work economically a railroad system of its own. The road will be worked by a joint management at Mayence, under the Prussian Ministry of Public Works, and as part of the Prussian State Railroad system, but the rights of Hesse are very carefully provided for, and it will have exclusive property in the lines on its own territory, though the income will be divided in accordance with a special contract.

In the last year reported the Prussian State Railroads had in their service 107,734 regular appointed employees and 179,428 "laborers," the latter engaged and dismissed at will like our employees. The total of both kinds was at the rate of 17.1 men per mile of road worked, which is

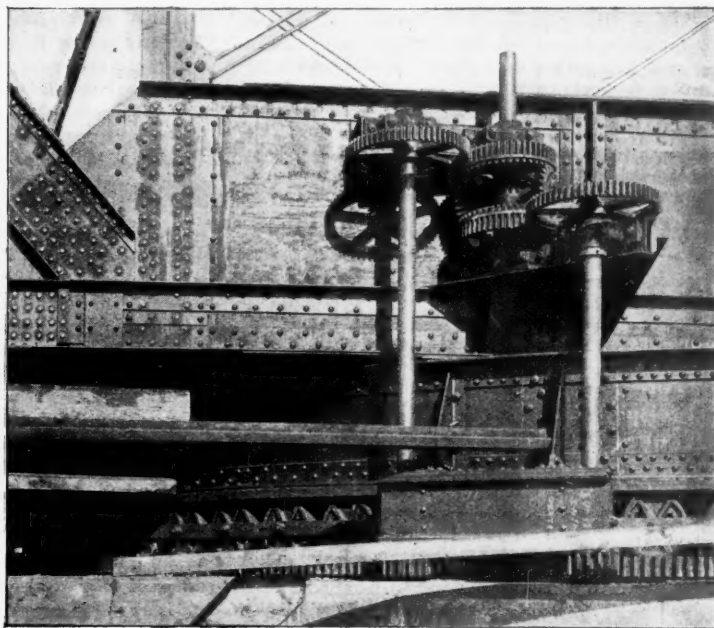


Fig. 3.—Operating Machinery—C., L. S. & E. Swing Bridge.

about 3 1/2 times the number of employees per mile in this country. For the accommodation of this force the administration had provided 28,400 dwellings and had made loans to certain building associations of employees which had built 281 houses, containing 1,254 dwellings. It provides free medical attendance, which in that year was given by 1,577 different physicians to about 90,000 persons. It had provided 271 bathing establishments and given \$15,600 in gratuities to laborers of 25, 35 and 50 years' service. The great benevolent institutions connected with the state railroads, however, were these:

Pension fund for regular employees, the payments out of which during the year amounted to \$2,488,838.

Laborers' sick fund, with 196,075 members (2,629 of them women), which disbursed \$1,149,925.

Laborers' pension fund, dispensing \$304,346.

Accident insurance, which paid out \$583,807.

In the year ending with March, 1896, the number of employees of all classes on the German railroads was 431,816, which was at the rate of one out of 120 of the entire population, and of 15 1/2 per mile of railroad, or just three times the number per mile in this country in 1893. The average yearly pay per employee was \$248 in Germany, while 10 years before it had been but \$209. The average in this country, judging by the cases reported for single railroads or states, is not quite twice as great as the German average.

Since 1885 the length of the narrow-gauge railroads in the German Empire subject to imperial supervision has increased from 238 to 806 miles; but there is a considerable number of such roads, especially among those built recently, not required to report. The average cost of the roads reporting has been \$22,406 per mile. Their net earnings averaged 3.76 per cent. on their cost.

The car ferries, which were for a long time peculiar to this country, are now commoner in Denmark than in any other country in the world, the various arms of the sea which cut up that country offering obstacles to through railroad lines. There are no less than 15 such ferries there now, all state property, and worked as part of the state railroad system. They transfer more than 100,000 cars yearly. The largest ferryboats carry 16 to 18 cars each, the small ones only six. They were first introduced in 1872.

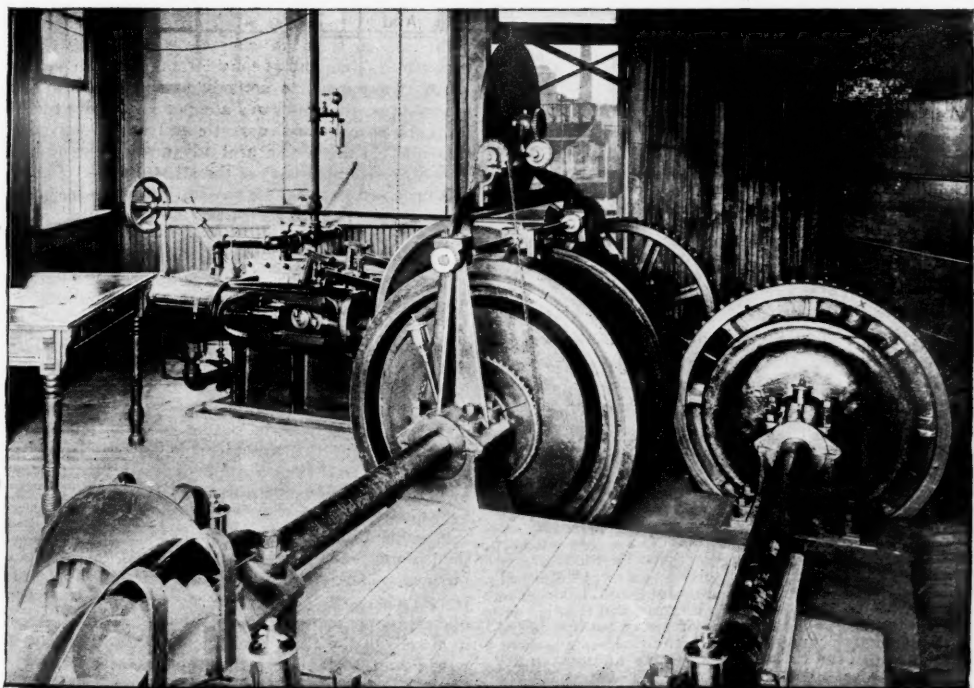


Fig. 2.—Interior View of Engine-House—C., L. S. & E. Swing Bridge.



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EDITORIAL ANNOUNCEMENTS.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Milk Rates to New York.

In another column we give an abstract of the elaborate report recently issued by the Interstate Commerce Commission on rates for the transportation of milk to New York City. We do not learn that there has been, or is likely at present to be, any change in tariffs as a consequence of the order; but the report is of interest as a discussion of a special branch of railroad traffic, and it affords an example of the working of government railroad regulation as now practised—or attempted—in this country.

The most obvious ground of complaint in this case, though not by any means the only one relied upon by the complainants, is that the rates are not graduated according to distance. As far as this argument is concerned, the theoretical basis on which the government, federal or state, is justified in making such an order as this is, practically, just the same as that on which the long-and-short-haul law is justified; no, better, no worse. (That law is not violated by these rates. It forbids a less charge for a longer distance but does not forbid an equal charge however great the disparity in distance.) That law has been on the statute books of Massachusetts for over 20 years and of other states for more than 10 years, but no one has ever shown a logical reason for its existence, except that where railroads have charged what seemed to be extortionate rates, this was often the simplest device that could be found for stopping a part of the extortion. On the other hand, the rule has in many cases proved hurtful, both to the carriers and to the public, and in interstate commerce has sometimes been suspended by the Commission.

In the milk-rate matter the first question is whether the very low rates for very long distances discriminate (1) against shippers of other goods or (2) against shippers of milk from other stations. Presumably the answer before the Commission to the first question was in the negative, as little or nothing is said on the point. To the second the answer seems to have been held by the Commission to be in the affirmative. Discrimination against the shippers near New York is said to be shown in the fact that these shippers have enjoyed no benefit from the increase which has taken place in the business during the past 8 years in consequence of the growth of New York City. But the action of the Erie, for instance, in making low rates from Binghamton and other points west of the starting point of its milk train was taken, we suppose, for the purpose of getting business—supplying milk to people in New York—which otherwise would go to some other railroad, bringing in milk from some other territory; and it is not proved, so far as we can see, that the short-distance shippers on the Erie would have reaped any greater advantage if the long-distance rates had never been made. If we are right in this, the argument that a reduction was needed because of the great difference in the rates per mile for the short and the long distances falls to of the ground, and the only way to justify a reduction the short-distance rates would be to show that they

are too high in themselves, regardless of the rates from anywhere else.

This, no doubt is really the main factor that has influenced the Commissioners' minds. The long and short haul principle has the respectability of age to sustain it, and it has proved popular with the law-makers and other non-railroad men because the railroads, in spite of the frequency with which it has done them harm without doing any one else any good, have so generally acquiesced in it; this being the case the Commissioners would naturally rely upon it somewhat for their justification, but their main reliance seems to have been the general profitability of the milk traffic.

From that standpoint the discussion opens up a wide field of inquiry. If we were to venture a conjecture, judging by the decisions of the courts in the past, the almost universal popularity of the long-and-short-haul law and the regularity with which the roads carrying milk to New York have avoided all loss or damage from delays or accidents, we should say that probably an appeal to the courts would result in the order of the Commission being sustained; but the basis of the decision would have to be arbitrary, as in the case of the long-and-short-haul law. Authority would have to be found in the general public feeling that group rates have a bad look, that rates graduated by distance seem logical, and that rates very much above the average receipts for all goods irritate the man who pays the bill!

From an economic standpoint the rate of 8 mills a quart does not look unreasonable, unless the railroad carries such very large train-loads as to make exorbitant profits. The Commission gives numerous statistics of the traffic, but the receipts per train mile, the most useful unit for comparison, we do not discover. A comparison of this with the receipts of passenger trains on the same road might give some light on the reasonableness of the rates. Eight mills a quart is only about one-tenth of the total cost of the milk to the retail consumer in New York. The great difference between the wholesale cost of the milk and the retail price, indicates that the skill and experience of the dealer constitute a large element of the value of the milk as it reaches the consumer; and where that condition exists a reduction of freight rates is likely to benefit the middleman alone, the farmer and the consumer both being left in the same situation as before. That reductions in transportation rates are not much felt by either the producer or the consumer of milk is also presumptively shown by the fact that the lower rates from New Jersey towns by the Lehigh Valley and from Connecticut by the New Haven have not forced reductions on the Erie, the Ontario & Western and the other roads.

Concerning the Northern Pacific.

It is with real regret that we hear of the resignation of Mr. Winter as President of the Northern Pacific. Our regret is not for Mr. Winter. He took up a harassing and an arduous task when he accepted the presidency last autumn, and since then neither the forces of nature nor the legislatures of the states have spared him. We have no doubt that he means exactly what he says: "It is with great pleasure that I look forward to the opportunity of taking a vacation." In fact, we never have any doubts as to the meaning of his words, for he is always candid and clear. Therefore the following statement of his reasons for resigning, quoted from an authentic interview, may be accepted without reading between the lines.

"I have tendered my resignation because Mr. Hill and his associates have acquired an amount of the capital stock which, combined with friendly holdings in Europe, entitle him to a strong voice in Northern Pacific affairs. My action was entirely voluntary and I trust the best of personal feeling exists between Mr. Hill and myself. I admire his ability and have regarded him as a friend for almost as many years as I have been in railroad service, but he could not name a sum that would induce me to work under his direction, and it is equally certain that he would not want my services on any terms."

Mr. Winter and Mr. Hill have been neighbors for many years. They know accurately, and respect, each other's ability and character, and they are wise not to try to yoke their wagons together. At the office of J. P. Morgan & Co. the following statement was made, and this also may be accepted in good faith:

"In an interview this week we assured Mr. Winter that if he remained with the property he should continue to have our entire confidence and fullest support, but for reasons given by him and for none others, he has tendered his resignation. You may state this without reservation. The stock of the Northern Pacific Railroad Company is held by five voting trustees: J. P. Morgan, George Siemens, August Belmont, Johnston Livingston and Charles Lanier. Messrs. Morgan and Lanier are now in Europe and the selection of Mr. Winter's successor will have to be deferred until their views are ascertained, or until the trustees shall have an opportunity to confer on the subject."

Furthermore, none who know Mr. Winter well, will borrow any trouble about his being out of a job.

The United States is full of railroads that want men of his stamp. Our regret is for the Northern Pacific. We had hoped for and expected prosperity for the company under the new organization. Tremendous influences, which no one could control, have worked against it the last eight months; but storms and floods are not perpetual and the Populist cannot endure forever.

When the reorganization was made it became apparent, from the history of the business of the road and from a study of its prospects and obligations, that the property could earn a surplus over the new charges. Indeed, the statement published in December showed for the year ending June 30, 1896, a surplus of \$1,310,593, against a deficit of \$3,377,776. It is true that in the last five months gross earnings have fallen off seriously and it is quite likely that expenses have increased from the action of some of the causes that have reduced earnings; but in the main these causes are abnormal and beyond the control of man and not to be expected in ordinary years. In November, blizzards began in the East and floods in the West, and the winter was of extraordinary severity. Two or three months ago the President wrote: "I am in the storm center of legislation and the elements." Speaking within the narrow limits of human judgment we can say that up to the time of his resignation the situation was in the main what it was when the reorganization went into effect—viz., barring the act of God the Northern Pacific would be pulled through and set on the way to permanent prosperity.

Now the situation changes. A St. Paul writer who seems to know what he is talking about says:

"It is pretty well known that during Mr. Hill's recent trip abroad, a deal was fixed up in London whereby the whole railroad situation in the Northwest was changed. Director Cannon, of the Great Northern, J. Pierpont Morgan, head of the Northern Pacific syndicate, and others had a conference there, and the result of it all is that Mr. Hill will henceforth be the dominating figure in Northern Pacific as well as Great Northern affairs. There is no consolidation about this, no close traffic arrangement on which legislation could have an effect, for what Mr. Hill has secured he purchased or his friends purchased for him. It is an accepted theory that the Northern Pacific stock to-day in the hands of Mr. Hill and his associates and those they immediately represent amounts to a controlling interest of the Northern Pacific."

If this is true, and many things point to its truth, it is the culmination of plans for the control of Northern Pacific which have long been in train and have been followed with unrelenting persistence. What the outcome will be we shall not venture to predict. It is a deep and subtle problem involving many variables and some extremely important unknown quantities. We shall attempt no analysis of it other than was contained in an article which we wrote 19 months ago, when a movement was on foot to consolidate the two properties. Part of that article we reprint, with the caution however that the present plan is not a consolidation and probably cannot be attacked directly by law, whatever may be its effect on inflammable Populist legislators. Surely it is not calculated to soothe them.

Here are two parallel lines from St. Paul and from the head of Lake Superior to the Pacific Ocean. They cover over 30 deg. of longitude, or about three-fifths of the distance from New York to tide water on Puget Sound. From St. Paul to Seattle by the Great Northern is 1,827 miles; from St. Paul to Tacoma by the Northern Pacific is 1,912 miles. The two lines command the best transcontinental zone in the United States. They are seldom more than 100 miles apart, touch at several points, and by their branches cover effectually the belt between the lines and at considerable distance north and south. They compete actively at their termini and at several important intermediate points. Their territory is inhabited by a most energetic and ambitious population, and has greater natural advantage than any other part of the country west of the Mississippi River. Now it is proposed to put these two railroads under one control and that control very strict and absolute, vested in fact in one strong man. No proposition of this nature and magnitude has ever been made before since railroad companies began that progress toward consolidation which seems as inevitable as the processes of nature. After all the talk about the power of corporations and the abuses of monopoly, after all the legislation to restrain corporate power and to secure competition, here is quietly produced a proposition to make a monopoly of the transportation business of a vast area and of a part of our population second to none in enterprise. No wonder that the Northwest is ablaze with indignation—or at least that a hundred newspaper offices are ablaze, for the people are said to be taking the matter very quietly.

It seems probable that much of the feeling against the plan comes from a misapprehension of its origin and purpose. The natural theory is that the Great Northern people wish to take advantage of the Northern Pacific's embarrassments to get control of a rival and to secure a monopoly of the great territory of the two systems. We have been told definitely that the proposition to put the Great Northern in control of the Northern Pacific did not come from the Great Northern, but from the Northern Pacific; that it was first made by the representatives

of a majority of the securities of the Northern Pacific; that Mr. Hill was at first reluctant to consider the matter at all, and that the plan was urged upon him by men to whom the prosperity of the Northern Pacific is of great importance, both in money and in reputation. To those men an alliance of the two roads seems necessary to the prosperity of the Northern Pacific and to the ultimate redemption of its securities; and of course if this alliance is made the Great Northern will control, because it is in a position to dictate the terms of the bargain. Indeed the first condition laid down by Mr. Hill was that he must control the majority of the stock. Without this he will not enter into the alliance, for to make it successful he must have actual and enduring control—not nominal or incidental control. But this one condition is in itself so formidable that it alone may defeat the whole project.

In this negotiation the Great Northern occupies a position of remarkable strength. Its total debt is less than \$28,000 a mile; it has no floating debt; it has much the best grades of any of the transcontinental roads (see *Railroad Gazette*, June 30, 1893, for comparative profiles of five roads); it has been worked from the first with the constant purpose of making net earnings, and its rolling equipment, yards, sidings and terminals are all efficient. The controlling idea is always to reduce the cost per unit of traffic, and not merely to show a great gross tonnage. In short, it has been designed and worked as a revenue-earning machine, not primarily as an enterprise for the enrichment of a few.

The Northern Pacific has a much greater debt per mile, how great the recent changes make it hard to say; its profile is better than those of any of the transcontinental roads to the south of it, but not as favorable as that of the Great Northern. For various reasons, for which the present management is not responsible, it cannot do work as cheaply as its greatest competitor. It is true that recently a good deal of money has been spent, according to sound principles, in raising the efficiency of the road as a transportation machine, but it is still at a disadvantage. Thus we see that it is not nearly so important to the Great Northern as to the Northern Pacific that competition should be abated. . . . If such control could be brought about, would it be for the interest of the properties? Would it be for the interest of the public? Would it be for the interest of the other Northwestern and transcontinental railroads? It is easy to see that the properties would profit by rates adjusted on a sound commercial basis and well maintained, and by the reduction of duplicate train and terminal expenses. Duplication of existing lines would also be saved. The Northern Pacific might lose by diversion of traffic, but one of the conditions of the settlement is a guarantee of a fixed minimum of net earnings. It is sound doctrine that the public served would gain also by rational rates, stable and maintained, and would share in the prosperity that would come to the roads from the economies possible under the alliance. There might be some reduction of train service to some of the communities; but it is probable that commercial considerations would produce adequate service as well as reasonable rates. Finally, it might be expected that the other railroads would be the better off for the removal of a powerful element in rate disturbances.

But back of all this are the social and political considerations which make the case so peculiar and so important. The people dread monopolies and dread the growth of corporate power. Probably this feeling is a good deal stronger in the West than in the East, but it must be reckoned with in both sections. A juster sense of the uses of corporations and of their rights and proper limitations seems to be growing up, especially toward the railroads. There are in the Northwest very sagacious railroad men, who know their country well, who think that if this plan is carried out it will alarm and exasperate the people, and will provoke a storm of hostile legislation. They believe that it will put back 'or years the development of that juster sense of which we have spoken. And these are not timid men, either, to be frightened by a populist scarecrow. . . .

The Reorganization of the Traffic Associations.

The Western Freight Association, the Western Passenger, the Southern States Freight, the Southern States Passenger and the Southwestern Traffic associations, the Southwestern Passenger Committee and the Southeastern Mississippi Valley Freight Rate Committee have all adopted, or are in process of adopting, new agreements for the purpose of continuing all of their functions which are not contrary to law as interpreted under the recent Supreme Court decision; and portions of the articles of agreement under which these several reorganizations are being carried out have been published. As, however, we have not yet received official copies of all of them, and as not all of the companies interested, in some cases not even a majority, have yet formally approved the new articles, we shall not at this time publish them; but the general tenor of the revised plans is already well understood, and, in fact, those of the different associations are substantially all alike. The proposed agreement of the Southern roads, for their freight association, states, in the preamble, that the association is formed—

"For the purpose of interchanging authentic information in regard to the tariffs of the respective parties, members of this association; for consultation and

mutual advice in regard to the reasonableness of tariffs, and the publicity of the same; and to aid in fulfilling the purposes of the laws of the states and of the United States. . . ."

And it further provides that the Executive Board shall have no power to bind members to do anything in restraint of trade; that each company is to notify the central board of proposed changes in rates three days before they are to take effect; that the chairman shall have power to investigate complaints of irregularity and to call for the records of the companies; and that it shall be his duty to discourage drawbacks, underbidding and other illegal devices.

In one important sense the relations of the companies to each other under these new agreements will be the same as they were under the old; each road puts itself "upon honor." Formerly each road was bound, in honor, to bring all proposed changes in rates to the notice of the association—that is, to the knowledge of its competitors—and to give them a chance to argue against a reduction before it should go into effect. Now it is bound, in honor, to bring each change before the association, as before, but not to postpone putting it into effect. Competitors may argue against the new rate, but will have to do their arguing after it has gone into effect.

Agreements in the past have depended upon honor, because there were (and are) so many loopholes by which the spirit of an agreement can be evaded while its letter is observed. This was true of all agreements except the Western Freight, the Southwestern Traffic and the Joint Traffic. Even these three were imperfect. They were immensely better than all previous organizations, in that each road agreed to act only through its Board of Directors, and the Southwestern had (as the J. T. A. still has) a very valuable instrumentality in the continuous conference; but yet they had not been made as strong as they might have been made, even without pooling. The Western Freight had very patent elements of weakness, and the Joint Traffic has not stopped all the leaks. The stability of rates in Eastern territory has been due in 1896, as in earlier years, to a considerable degree, to the forbearance of the strong lines. They have refrained from complaining of secret rate cutting when they were well satisfied that it was going on.

All the resources of an "honor" association being still available it will be possible, theoretically, to maintain a very good degree of stability of rates under an agreement like that of the Southern roads. If they "mutually consult and advise in regard to the reasonableness of tariffs," there is no reason why they should not arrive at pretty harmonious results. It is true that the consultations ought to be frequent—perhaps four times a week—and that every member ought to attend every conference; for experience teaches that silence (—talking away from conference—) has been a common resource of railroad officials who were bent on destroying harmony; but why cannot such regular conferences be established? They constitute one of the principal elements of strength in the Joint Traffic Association, and were proportionately valuable in the Southwestern. The Southern or any new association based on these regulations, without daily conferences, will probably go the way that dozens of Chicago agreements have gone during the past 20 years. To consult, with any useful result, about reasonableness of rates, where competition is as sharp as in the Western and Southern states, means not only that "mutual advice" shall be given, but that it shall be heeded—heeded, at least, to the extent that everyone shall be induced to be very moderate and cautious in making reductions; and the best way to insure moderation and caution is to establish a conference board like that of the Joint Traffic Association.

Moderation and caution are said to prevail already to a good degree in the West, so much so that the reporters are a good deal puzzled to discover the difference between the old and the new agreements. As rate cutting has not yet broken out with virulence anywhere, they conclude that no real difference exists; that, by some legend-main, which they do not understand, the railroads have maintained their agreements as before. This is easily explainable, thus far, on the same grounds that the unusual stability of rates was explained in 1887, just after the Interstate Commerce law took effect. It is even more easily accounted for in many cases; for rates are down so near the cost level that many traffic officers who have revelled in rate-cutting all their lives find few opportunities for making cuts that would be worth while. Moreover Mr. Morrison would tell us that the rascally rate-cutters now have the fear of the Brown decision before their eyes.

But whatever the cause of the present comparative stability, there can be no satisfactory feeling that it will be permanent unless the competing companies in each district confer with one another; and such con-

ferences, to reach the obscure irregularities which the law does not get hold of, and which in many cases are of doubtful illegality, must be regular and frequent, and be attended by officers who have the power to act. The law is slow at best. The railroads cannot afford to wait for the courts to punish illegal rate cutting (if there be any), and they certainly cannot expect any assistance from the courts or the commission in repressing reckless disturbance of rates within the sanction of the law; so they need the most effective associations that can be devised. Legal rate reductions may be as harmful in the future as illegal reductions have been in the past.

Annual Reports.

Lake Shore & Michigan Southern.—The annual report of the Lake Shore for the year ending Dec. 31, 1896, is received. The miles operated were 1,439.7, being practically the same length of line as for the last four years and about five miles less than the mileage of 1890, 1891 and 1892. The main results of operation were:

	1896.	1895.	Inc. or Dec. Per cent.
Gross earnings.....	\$20,183,978	\$21,016,035	D. 3.91
Oper. expenses and taxes..	13,726,155	14,568,220	D. 5.78
Net earnings.....	\$6,467,803	\$6,447,815	I. 0.31

Net interest and rentals amounted to \$3,445,403, and after paying dividends of \$2,967,990, or six per cent., the surplus balance credited to income account was \$54,410. The year before the surplus carried over was \$60,325.

The decrease in gross earnings, namely, 3.91 per cent., was in freight, the earnings from which were \$13,289,042, being \$868,383, or 6.13 per cent. less than in the previous year. The passenger earnings were a little more than one-tenth of 1 per cent. greater than in 1895, the total being \$4,520,045. The earnings from mail and express, etc., were 1.65 per cent. greater than in 1895, namely, \$2,384,871. The decrease in freight earnings was due to a smaller tonnage, decreased ton mileage and lower rate; that is, the tons moved fell off 5 per cent., the total being 13,662,419. The ton miles fell off 3.97 per cent., the total movement being 2,377,084,118. The rate per ton per mile fell from 0.5615 cent. to 0.5487 cent, or 2.28 per cent. This is the lowest rate recorded on the Lake Shore, and in fact the decline has been progressive year by year for the last 27 years. The average freight rate last year was 29 per cent. of that received in 1870.

The passenger business showed a decrease of 2.32 per cent. in number carried, the total having been 4,519,887. The passenger miles fell off 0.07 per cent. and the total movement was 211,120,566 passenger miles. The rate received, however, was 2.141 cents as compared with 2.139, which accounted for the slight increase, namely, \$7,637 in passenger earnings.

The elaborate tables always published in this report enable us to ascertain with considerable accuracy where the decline in freight was. It appears that the ton mileage eastbound was actually greater by 50 millions than in 1895. Westbound, however, it was less by 149 millions. There was a smaller movement by 10 per cent. in merchandise and other articles; by 7 per cent. in manufactures, and also a diminished movement in iron ore, timber and other building materials and in iron in all its forms. The coal movement increased somewhat. There was an increased movement of grain, flour, provisions and all agricultural products. Taking all these facts together, we may infer that the farmer suffered less from the hard times of 1896 than anyone else in the community.

The saving in operating expenses, including taxes, was \$842,065, or 5.78 per cent. The charges to maintenance of way and structures actually increased by \$176,000, but there was a saving of \$771,000 in maintenance of equipment, and of \$263,000 in cost of transportation. The saving in maintenance of equipment, however, was not in repairs and in ordinary expenditures, but there was a less expenditure of about \$407,000 for new locomotives, and about \$373,000 for new freight cars. The saving in conducting transportation was pretty well distributed through the various items, and we may suppose that it was largely due to the heavier loads and the smaller train mileage; that is, while the ton miles decreased 3.99 per cent. the freight train miles decreased 4.91 miles, and the average train load was increased from 318.5 tons to 321.6. This increase has been going on for a good many years, but was greater in 1895 than in any one year before. That year it was about 41 tons; last year it was 3 tons.

The country has lately had evidence of the strong financial standing of the Lake Shore, and many have learned lately, what a few railroad men have long known, the steady and costly improvements in physical condition which have been carried on for years without increase of charges to capital. In this report there is internal evidence of these matters. The capital stock still stands as it has stood for 25 years; the funded debt was still further reduced during the year. The continued increase of train loads is in itself evidence of the improvement in track and equipment, and expenditure for betterments still goes on, and is charged to operating expenses. For example, in 1896, \$816,302 was spent for new equipment, \$95,443 for changes of grade and \$30,780 for new sidings, which now aggregate 719.32 miles in length, or almost 50 per cent. of the length of the main line. In the year \$216,000 was spent on renewals of rails \$303,000 on renewals of ties and \$431,000 on renewals of bridges, buildings and fixtures, all of which was charged to operating expenses.

Mexican Central.—The report of the Mexican Central Railway Co., Limited, for the year ending Dec. 31, 1896, is received. The average miles operated in that year were 1,889.6, the increase having been 9.77. The net increase in mileage for the year was 78.7, making the total at the end of the year 1,955.66. The side tracks aggregated 157.95 miles, or 8 per cent. of the main line.

The main results of operation for the year were as follows (in Mexican currency):

Gross earnings.....	\$10,208,020	Inc. \$712,155
Oper. expenses.....	6,744,273	Inc. 1,144,883
Net earnings.....	\$3,463,747	Dec. \$432,728

The average price at which the company sold Mexican dollars for the year was 53.17 cents as against 52.95 cents the year before. The price fluctuated from 50½ cents to 56½. Reducing the income account to United States currency, we have:

Net earnings.....	\$1,841,516	Dec. \$221,641
Interest, etc.....	2,524,527	" 3,882
Deficit.....	\$483,011	Inc. \$217,759

The deficit was provided for in both years by amounts withdrawn from the subsidy trust fund.

The gross earnings increased in nearly every item. The greatest increase was in international freight business, namely, \$437,767. A further item in the increase was construction material, amounting to \$132,186. The local passenger business increased over \$73,000, and the international passenger business increased over \$33,000. The increase in baggage, express, etc., was \$104,398. There was a decrease of nearly \$69,000 in local freight business. The increase in gross was 7.5 per cent., and excluding construction material, 6.15 per cent. The loss in local business was largely due to the drought, which caused total or partial failure of crops in much of the territory of the system, and as a result there was a heavy increase in corn imported from the United States which the government permitted to come in free of duty. Under normal conditions the increase in gross revenue would have come from local traffic. In fact, from the tabulation of results for 12 years it appears that gross earnings, both absolute and per mile, have increased steadily year by year. In 1885 they were \$3,559,561 and in 1896 they were \$10,208,020. While the mileage of the road increased 51.27 per cent. the gross commercial earnings increased 183.27 per cent. The earnings per mile operated increased from \$2,859 in 1885 to \$5,353 in 1896, and in all that period there were only three years in which the earnings per mile decreased, and then but little.

There are several reasons why we may expect that the increase in earnings will continue. In the first place the rate war on the international freight traffic was ended in December by re-forming the Mexican Traffic Association, and the new agreement is more advantageous to the Central than the old one. Furthermore, it is believed that the cost of the breaking up of the old association has been more than made good to the company by the impetus given to the port of Tampico, which is now the port of largest tonnage in Mexico. This port is reached only by the Mexican Central and by the Monterey & Mexican Gulf, which latter road runs northwesterly 623 miles, through Victoria and Monterey, to a junction with the International at Trevino. In 1896 the total business through the port of Tampico increased \$13,417,671 or 69.93 per cent., while the total business through Vera Cruz decreased \$5,885,672, or 13.52 per cent. In 1896, 41.44 per cent. of all the exports of the Republic went out through the two ports of the Mexican Central, El Paso and Tampico, and of all the imports 26.89 per cent. came in through these two ports. In addition to this a large amount of exports and imports which went through Eagle Pass was delivered by the Central to or received from the Mexican International at Torreon, giving the Central a long haul on this business. In considering all this it must not be forgotten that nearly 70 per cent. of the gross revenue of the company is on local business.

The distribution of working expenses was as below:

Maintenance of way and structures.....	\$984,771	Inc. \$105,259
Maintenance of equipment.....	1,206,196	" 246,869
Transportation and traffic.....	2,920,122	" 725,526
General expenses.....	633,184	" 67,229
Total.....	\$6,744,273	" \$1,144,883

General repairs of track were less than in 1895, but considerable money was spent, and charged to operating expenses, on renewal of rails and ties and repairs to bridges. About 110 miles of 56-lb. rail was renewed with 66-lb. The tie renewals for the year amounted to 261,938 in number at a cost of \$271,133. Mexican; 8,800 lin. ft. of wooden trestle bridges were removed, of which 3,158 ft. were filled with earth and 5,642 replaced by cast-iron culverts. For this work \$47,743 was charged to operating expenses.

The increase in transportation expenses was largely due to the increase in locomotive and train mileage caused by greater traffic. The ton-miles increased 27.29 per cent., two-thirds of this being on business via Tampico. But further, the transportation expenses were increased by the drought, which compelled the company to haul water. At one time water for the locomotives at Tampico had to be brought 70 miles, and for about six months a steam tug service hauled water in barges from a distance of 40 miles. A pipe line 10 miles long, costing \$90,000, Mexican, has now been constructed to carry water to Tampico, which will insure an abundant supply and stimulate the establishment of industries at that terminal.

Of course operating expenses are considerably increased by the cost of exchange with the United States, as most of the material used for renewals has to be purchased

outside of Mexico. In the six years beginning with 1891 the increase in the rate of exchange has caused an increase in operating expenses of \$804,612.

During the year nine new locomotives and 255 cars were added to the equipment. Since the close of the year orders have been placed for 26 locomotives and 650 cars.

It appears that the new terminal passenger station at Boston is to cost ten or eleven million dollars. The Boston Herald states, apparently on the authority of information given at a public hearing by representatives of the railroads, that the sum of \$7,581,797 has already been expended for real estate, and that contracts have been made for other expenditures aggregating \$3,289,440, making a total of \$10,871,237. Of this, however, \$1,789,440 is to be paid by the city, leaving the amount chargeable to the Terminal Company \$9,081,797. To this must be added the sums necessary to lay the tracks, estimated at 12 miles in length, to furnish the interlocking signals and apparatus for compressing air, and for furnishing the station. "And there is no prospect," says the Herald, "that the increase of business will pay for a tithe of the increased interest obligation. . . . The cold facts in the case are that these roads have taken upon themselves this enormous indebtedness purely for the accommodation of their patrons—a matter that the enemies of railway corporations in general will have a hard time to reconcile with their claims that these corporations are the sworn oppressors of the public, and that whatever they do in the way of improvement is simply a cloak to cover up some new raid upon the rights of their patrons and the communities they serve."

NEW PUBLICATIONS.

Die Eisenbahn Technik der Gegenwart. Herausgegeben von Blum, von Borries und Barkhausen. Part I. of Vol. I. of a comprehensive work on Railroad Technology, recently issued from the press of C. W. Kreidel, Wiesbaden.

This work when completed will be in three volumes, each a treatise on a separate part or division of railroad work, as follows:

First Volume.—Railroad Machinery, including Locomotives, Cars, Machine Shops, Car Shops, Foundries, etc.

Second Volume.—Railroad Building, including Location, Construction of the Permanent Way, Construction of Track, Ballasting, etc., Terminal and Station Facilities, Station Buildings, Yards and Appurtenances, including Coal and Water Stations, etc., Signals and Safety Appliances.

Third Volume.—Railroad Operation and Management, including Management of German and Foreign roads compared, Policing the Line, Station Service, Train Service, Switching Service, Maintenance and Repairs, including Maintenance of Permanent Way, Buildings and Structures, Locomotives and Cars; also Statistical and Economic Results.

The first part of the first volume treats exclusively of the locomotive and tender, and by the comprehensive and thorough way in which this subject is handled in the 368 pages contained therein, gives an impression of the complete work as being of rather formidable magnitude. The part now finished is made up of short treatises on the different topics into which the subject is divided, each treatise being written by one of the authors or by some other authority on the subject discussed.

The book comprises the classification and general arrangement of locomotives for main and branch lines, the performance of different types of locomotives and the general and detail design of the locomotive and tender, including the design and proportions of compound locomotives of several different types.

The text treats principally of European design and construction, although some data and examples of American practice are given under each of the principal details. The arrangement of the work is good, and much of the subject matter is interesting and valuable to American as well as to European locomotive designers and engineers.

The chapter on locomotive performance contains interesting diagrams, on which are plotted the horse-power at speeds varying from 10 to 40 and 10 to 90 km. per hour of five different designs of locomotives, one of them being compound. Diagrams showing the horse-power per 1 sq. m. of heating surface at the above speeds, and the horse-power per each square meter of heating surface for from one to four revolutions per second for these same engines, are also given. All these engines are of German design.

The formulae and data already derived are further developed, utilized and clearly explained in the following chapter on the calculation of the principal parts of a locomotive. In the example taken the calculation is made both for simple and compound cylinders.

The chapter immediately following the above treats very fully the movement of a locomotive on straight and curved track. The design of the boiler and its attachment, the running gear and the driving and valve mechanism and locomotive valve motions are quite thoroughly described and their advantages and disadvantages shown.

The chapter on compound locomotives by Mr. F. Bruckmann is not only quite complete historically, with ample references to recent reports and publications, but treats briefly and clearly of the theory and design of compound locomotives with much detail information

about the valve motion used on a number of such locomotives on some of the principal German railroads. The tables showing the principal dimensions of a large number of European and American compounds of all types are very full and complete.

The brakes, injectors and other attachments of the locomotive are also treated in a final chapter, after which the design of the tender is well considered, but almost entirely from the standpoint of German practice. This part of the work closes with chapters on rack rail locomotives and small locomotives for street service and various special conditions met about manufacturing plants and mines.

This book is unique in its chapters on locomotive design, it being far more complete in this important department of mechanical engineering than any English work of anything like its scope. It is to be hoped that at least these chapters may soon be translated and published for the benefit of those unfamiliar with the German language.

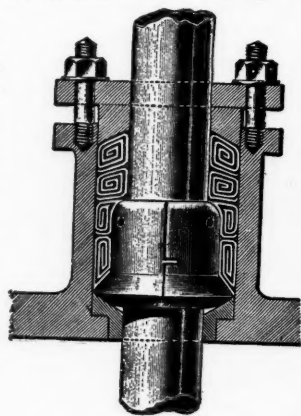
Interstate Commerce Commission, Tenth Annual Report.—This report, noticed in the Railroad Gazette of Dec. 25, being for the year ending Dec. 1, 1896, has now been issued in permanent form, with the appendices, the most important of which are one of 130 pages (B), giving a synopsis and index of points decided by the Commission since its organization; (D) a statement of mileage paid by railroad companies for the use of private cars, both passenger and freight, for the year ending June 30, 1895, to which is added a list of individuals, firms and corporations owning such cars and the amounts received by each; (E) a list of automatic couplers and power brakes in use on each railroad, as reported by the companies; and (F) an abstract of railroad laws in the several states, including legislation in regard to safety appliances.

TRADE CATALOGUES.

Contractors' Machinery.—We have received from the F. C. Austin Mfg. Co., Chicago, a handsome, 76-page catalogue illustrating especially its various appliances for handling materials for street, road and railroad embankment construction. These include rock crushers, grading and ditching machines, road rollers, portable engines, rock drills, scrapers and other contractors' tools, beside several different machines for driving deep well.

A Combined Metallic and Fibrous Packing.

We reproduce from *The Engineer* (London) an engraving of Ogden's packing, which is introduced by the Frictionless Engine Packing Co., Limited, of Manchester.



The object has been to combine the best points of metallic and fibrous packing. A special point aimed at in the design of the details has been to avoid any necessary alteration in standard stuffing boxes. There is a bushing of a special metal divided into three segments, the joints cut tangentially, so that the wear is taken up automatically. This bushing is kept in place by Karwal's

packing, which fills the remainder of the box, dispensing with the necessity for springs.

In Mr. Wallis-Taylor's little book, "Bearings and Lubrication," recently published in New York by D. Van Nostrand Co., and in London by William Rider & Son, Limited, this packing is illustrated, and the author says of it: "The whole ring thus formed is bedded in a fibrous packing, thereby giving it a floating quality which admits of its adapting itself to a rod running out of truth. The construction of the segments, moreover, allows of a rapid adjustment to a worn or fluted rod, and obviates any necessity for turning up the latter."

The Sand Track as a Labor Saver.

We have been asked for further information as to the use of the sand track in the yards at Friedrichstadt, Dresden, and other places in Germany. It is now asked whether this device, the value of which as an emergency appliance is unquestioned, will save any time or labor over the present methods in use in America.

Inquiry among the employees of the Royal Saxon railroads goes to show that the sand track can be used in a switching yard to advantage, in regular work, when all car movements are effected by gravity, after the train to be drilled has been hauled to the top of the gravity plane. In Friedrichstadt the height of this grade is 19 meters, 62.34 feet; the gradient being 1 in 100—an amount of fall which very seldom fails to suffice to bring all the cars into their desired positions, against the heaviest (east) winds.

The stoppage of the cars at the proper places is effected by what the Saxons call Gleisvorleger, and we might call "slipper brakes." This is a casting, shoe, with

wrought iron laid on each rail, and the pair of shoes is connected by a stout iron rod, which has in its length two single coils, or turns, that serve the double purpose of handles by which to lift the rig and of permitting a slight variation in the gage on curves or badly-laid tangents. One of these slippers suffices for one side only. On meeting with the obstacle the wheel keeps on turning with reduced velocity and the slipper slides a trifle.

The slowing up by means of this frictional resistance is in inverse proportion to the number of axles. It is, therefore, impossible to stop rapidly-moving groups of cars by such a slipper brake, and it is necessary to slow them up by some means or other before reaching the slippers. As a rule the wheel brakes are used for this purpose, but as in Germany not all the cars are furnished with brakes, brakesticks (Bremsknütteln) are used. These are stout, rough, round sticks, thrust between the axle-springs and the tires, and jammed hard against the latter by a man who runs alongside the car to be slowed up, or who hangs on the pole, balancing himself more or less gracefully on his belly—this being easier and more effective than running.

In Dresden the stoppage of cars by men with brakesticks, in drilling, is common, and has been for years. But in the new Friedrichstadt switching yard a test has been made to see, if in good weather the desired slowing up could not be effected by means of sand-tracks, in order to save labor; and this experiment has succeeded.

The arrangement was shown on page 535 of the *Railroad Gazette* for July 31, 1896. There are two reaches of sand-track line, and of these one is for single cars and pairs, and the other only for groups of three or more cars which are switched into it. This arrangement calls for a switchman for each pair of tracks on which the trains for any desired destination are to be broken up. The track-sections to be strewn with sand have lengths of 41 meters and 21 meters for the upper and the lower (that reach through the switch), respectively. As the resistance on a sand-track with 2 in. of sand on it is about 0.0625, or $\frac{1}{16}$ of the load, and the track has a gradient of 1 in 100, a velocity of 14.27 miles an hour can be taken up by the sand-tracks.

At the great gravity switching-yard at Edgehill, Liverpool, the retardation of the down-running cars is effected by men who stand at definite places along the tracks down which the cars run, and apply the wheel-brakes by levers attached thereto, which project out along the side of the cars and may be grasped by three men as the cars go by.

The sole use of the twenty or more sand-tracks in the Friedrichstadt yard is to save labor and time. It is evident that the speed of the unbraked cars may be perfectly controlled by the thickness of the sand on the rail, according to the condition of the uncovered rail and the direction and force of the wind, and that in consequence cars may be handled not only with greater convenience and speed, but with less labor, than where brakes are set up by hand on one or more cars of a group.

The results of these tests on a large scale in the Friedrichstadt yard warrant the introduction of the sand-track as a labor saver in other places where hitherto the slipper-brake and the brake-stick have been used.

The sand track also greatly diminishes the danger to life and limb of the brakeman, and the wear and tear of bumpers, brakes, etc., is materially reduced.

TECHNICAL.

Manufacturing and Business.

The firm of Fraser & Bailey, dealer in railroad supplies, has removed its offices from 72 Trinity Place to the new Bowling Green Building, 11 Broadway, New York City. The company is sales agent for Roberts, Throp & Co., manufacturers of section cars, and the Johnston Railroad Frog & Switch Co.

The Chicago Pneumatic Tool Co., Monadnock Block, Chicago, last week received an order by cable for 16 No. 2 Boyer hammers and 20 drills for a firm in England, and for three Boyer hammers for shipment to Torino, Italy. It also received an order for four hammers from Moscow, Russia, five hammers from Copenhagen, Denmark, three No. 2 hammers from Vienna, Austria, and one piston drill. The company is running two-thirds of its machinery 20 hours out of 24, and is increasing its shop capacity by an addition of six special machines. The company ships regularly to one firm in London 20 hammers and 20 drills each month.

The Ridgely & Johnson Tool Co. has been incorporated at Springfield, Ill., to manufacture a valveless pneumatic hammer. Joseph T. Ryerson & Son, 18 Milwaukee avenue, Chicago, are the sole agents.

The D. & W. Fuse Co., of Providence, R. I., has been incorporated by Louis W. Downes, Wm. C. Woodward, Louis T. Downes, Adolph T. Vigneron, David C. Moulton, Dutée Wilcox and Geo. K. Cranston, for the purpose of dealing in electrical and other machinery and supplies. The capital stock is \$50,000.

The Schroeder Headlight Co., of Evansville, Ind., last week shipped a number of its locomotive headlights to Mexico.

The McCord journal box, made by the Drexel Mfg. Co., of Chicago, is being used on 300 cars now being built by the Wells & French Co., for the Armour Packing Co., and it is specified on the freight cars of the Colorado Midland, the contract for which was recently awarded to the Pullman Palace Car Co.

The Baker Forge Co., of Ellwood City, Pa., has received the contract to furnish all the forgings for the 600 steel cars being built by the Schoen Mfg. Co., of Pittsburgh, Pa., for the Pittsburgh, Shenango & Lake Erie Railroad.

The Willis Engine & Machine Works, of Columbia, S. C., has rebuilt a locomotive for the Carolina & Cumberland Gap road. The same works last year rebuilt an engine for the Columbia, Newberry & Laurens, which was badly disabled in a wreck.

The Pennsylvania Steel Co., of Steelton, Pa., has received a contract to roll about 2,000 tons of girder rails for the Milwaukee (Wis.) Electric Railway & Light Co.

The annual meeting of the National Switch & Signal Co., which was to have been held at Easton, Pa., last week, has been postponed until the first Tuesday in June.

Willis Shaw, dealer in contractors' machinery, 506 New York Life Building, Chicago, has just shipped a carload of hoisting engines and rock drills to the Southern California Mountain Water Co. He has also secured an order from Venable Bros., Atlanta, Ga., for an 800-ft. span suspension cableway for their granite quarries. Among other sales are: two channeling machines to Flynn & Co., Philadelphia; 56-ton steam shovel to A. J. Twiggs, at Augusta, Ga.; crushing machinery to the Dessau Co., Iron Mountain, Mich.; hoisting and quarrying machinery to Watkins & Hardway, Tallahassee, Ala.; Williams & Schmidt, Granville, N. Y.; Mathews & Keith, Manitowoc, Wis.; Consolidated Stone Company, Chicago, and G. R. Root, Buckingham County, Va.

The Newton Machine Tool Works, of Twenty-fourth and Vine streets, Philadelphia, Pa., reports a steady increase in business. The works are running full time with almost the entire force of men. During the past month orders were received for a heavy milling machine equipment for a Japan railroad shop, a large duplex milling machine for the French government and vertical milling machines for Fraser & Chalmers, London. Among recent domestic orders were two rail ending machines for the Pennsylvania Steel Co., and large Universal cold saw cutting-off machines for the Lassig Bridge Co., Chicago, and Post & McCord, New York. Several other orders for cold saw cutting-off machines and heavy milling machines were also placed with this company.

The Hartford Steam Boiler Inspection & Insurance Co. has recently made a number of changes in its agencies. Curtis C. Gardiner, Jr., becomes Assistant General Agent at St. Louis; James W. Arrott, General Agent for Allegheny County, Pa., with office at Pittsburgh; Benjamin Ford, Chief Inspector for the same district; Scott R. Benjamin, General Agent at Hartford, and James L. Foord, Chief Inspector for the Northwestern department, with headquarters at Chicago.

Walter A. Crandell, for a number of years connected with the Rhode Island Tool Co., of Providence, R. I., has been appointed Treasurer and Manager, to succeed William B. Dart, deceased.

Iron and Steel.

The Midvale Steel Co. has given a contract to the Schiffer Bridge Co., of Pittsburgh, for a heavy ordnance machine shop to be built at Nicetown, Pa. The building will be 190 x 112 ft. in size.

The Shenango Valley Steel Co., New Castle, Pa., will increase its capital stock from \$500,000 to \$1,000,000, for the purpose of putting in a billet mill and making other additions to equipment.

Bids were opened at the War Department at Washington, on April 29, for the supply of a quantity of heavy shot, as follows: Midvale Steel Co., 12-in. shot, \$495 each; 8-in. shell, \$72 each; Carpenter Steel Co., 12-in. shot, \$370 to \$450 each, dependent on time; 8-in. shell, \$80.08 each. Sterling Steel Co., 12-in. shot, \$500 each; 8-in. shell, \$83.06 each.

No. 1 furnace of the Crane Iron Co., at Catsauqua, Pa., is being blown out after a run of two years and eight months.

Pig-iron stocks continue to pile up, but there is a slight increase in the demand. Sales of Bessemer pig during the past two weeks amounted to 60,000 tons, with prices the lowest on record. Pig iron was selling at Birmingham, Ala., last week at \$5.50 a ton, with a reduction in freight rates of 40 cents a ton to Northern points, which, however, will not affect the Pittsburgh territory to any great extent, owing to present low rates from that section. Prices of steel rails remain nominal, \$19@20, with no demand. Many furnaces in the Mahoning and Shenango Valleys and at other points have closed and others are preparing to do so.

On application of the Croton Limestone Co., of Newcastle, Pa., Judge Wallace has appointed E. N. Ohl and W. E. Reis receivers for the Atlantic Iron & Steel Co., of Newcastle. The Court has given the receivers permission to operate the Atna furnace.

New Stations and Shops.

The new shops which are to be built by the Missouri, Kansas & Texas at Sedalia, Mo., will comprise a freight car shop, 110 x 224 ft.; paint shop, 150 x 164 ft.; machine shop, 160 x 175 ft.; blacksmith shop, 60 x 125 ft.; engine and boiler house, 50 x 100 ft.; wood mills, 80 x 150 ft., and passenger erecting and upholstering shops, 100 x 146 ft. The plant will cost about \$300,000, of which amount the citizens of Sedalia will contribute \$100,000, besides donating a large tract of land.

The new passenger depot to be built at Rochester,

N. Y., by the Lehigh Valley, will be 50 x 70 ft. in size of pressed brick and stone, and will have a clock tower 140 ft. high. The cost will be about \$250,000.

The Boston & Maine has given a contract to the Head & Dowst Co. for a new passenger station at Manchester, N. H. The building will be 228 ft. long, and will vary in width from 44 to 70 ft. The general waiting-room will be 108 x 40 ft. The building will be one story high, with a tower about 80 ft. high. The material is light buff brick with brown stone base and trimmings. The principal rooms will have marble tile floors, and the entire building will be heated by hot water.

The Louisville & Nashville has given a contract to Charles A. Morse, General Contractor, Chicago, for a new passenger station at Montgomery, Ala. The contract price was \$79,000.

Cast Bronze on Journals.

A method of reducing the wear in those parts of a locomotive where it is the greatest has been used with success by Mr. G. L. Potter, Superintendent Motive Power, Pittsburgh, Fort Wayne & Chicago. It consists in casting a shell of bronze upon the surface to be protected, and afterward fitting it to the other surface. In the case of the rockers and their boxes, a bronze sleeve is cast upon the rocker journal and then fitted to the box. When it is necessary to take up wear the box is simply rebored, and a new sleeve cast upon the rocker shaft and turned to fit the box. The eccentrics are faced in a similar manner. These are rough-turned about $\frac{1}{8}$ in. smaller in diameter than the straps, and of such a form as to hold the bronze. A shell of bronze is then cast on each eccentric and afterward turned off to fit the strap. Wear can be taken up in the same way as in the case of the rockers, by casting a new shell on the eccentric and fitting it to the strap. A locomotive will go through the shop several times before the wear need be taken up in these parts, and then the repairs are easily made. Engine truck wheel hubs are also treated in the same way. The hub is faced and turned to a dove-tail section, after which a bronze facing is cast on. The bronze face is left about 12 in. in diameter, giving a large surface which wears with good results.

A Good Wheel Record.

Mr. J. C. Shields, Superintendent of the Mineral Range Railroad Co. and the Hancock & Calumet Railroad Co., Hancock, Mich., has addressed to Messrs. A. Whitney & Sons, Philadelphia, the following letter, which we are permitted to publish. The wheels spoken of are 24-in. in diameter and used in freight service on a narrow-gauge railroad. This is a good instance of what good chilled cast-iron wheels can do in the way of wear. "Mr. Hanson, our Car Repairer, called my attention this morning to the fact that he had taken out a pair of Whitney wheels which have been in service on our roads for 24 years. I noticed builders' number on inside of wheel, 6-16-73. Our record shows these wheels in continual service from 1873 with a mileage of over 150,000 miles. The wheels are single plated, and on placing my rule across the face, I find they are not worn more than quarter of an inch in the tread. The reason the wheels were taken out was on account of a small piece breaking out of the side of one. This seemed to me to be extraordinary service for old-time wheels, taking into consideration the fact that we operate in a very mountainous country, with six months of the year very severe, cold winter weather, and I thought I would draw your attention to what we consider a good record."

Subjects for the Conventions.

The Master Mechanics' Committee to submit subjects for the 1898 convention, also subjects for topical discussion for the noon hour during the coming 1897 convention, asks every member of the association to send to the chairman one or more subjects, which, in his judgment, would be desirable for committee work for the coming year; also subjects for topical discussion. The committee has thought proper to delay the issue of this circular of inquiry to this late date to give the members an opportunity to consider the latest discussions in the various railway clubs and the current railway and technical papers, hoping thereby to draw out good, live, up to date subjects, and earnestly requests that you will give this circular your immediate attention and prompt reply. Address replies to W. H. Lewis, M. M., C. B. & N. R. R., La Crosse, Wis., not later than May 15.

A Car-Heating Patent Decision.

The interference litigation between the patent of Edward E. Gold, President of the Gold Car-Heating Company, granted Nov. 14, 1893, for a pneumatic discharge of condensation water from the drainage tanks of car-heating apparatus, and the application of Robert M. Dixon, of the Safety Car-Heating and Lighting Company, claiming the same invention, which has been proceeding for nearly two years past, and which was originally decided in favor of Gold, has just been again decided in his favor by the Appeal Board of the United States Patent Office. The object of the invention is to simultaneously drain all the cars of a train—at the terminus, for example—by a single manipulation of an air valve. The decision is that on the proof Gold was the first to conceive the invention and the first to reduce it to practice, and that the testimony on behalf of Dixon is too uncertain as to dates to be relied on to give him a date of conception as early as he claimed. Mr. Dixon sought to make it appear that he had communicated the invention in controversy to Mr. D. L. Barnes, and that Barnes communicated it to Gold, and hence that Gold was not a *bona fide* inventor. This at-

tempt is thus treated in the decision: "All that Barnes apprehended from Dixon and could have imparted to Gold was far short of the means here in issue, and was nothing beyond what it is proven on behalf of Gold that Gold had in the year 1889. We find that it is not proven that Dixon's invention was communicated to Gold before Gold made his invention, or at any other time; that Gold and Dixon are independent inventors, and that Gold is the prior inventor." The effect of this decision will be to confirm the validity and ownership of the Gold patent; but we are informed upon inquiry that this decision is reached in an entirely different manner from that reached by the original examiner, who gave credence to Mr. Barnes' affidavit and gave priority of invention to Mr. Dixon, although withholding the patent because he had not made his application promptly. We are also informed that no final determination of the controversy can be had until it has been passed upon by an appeal to the Commissioner of Patents, which appeal will be taken. Therefore, the final determination of this question as to who is the prior inventor in this case must await the decision of the Commissioner of Patents and such higher court as the matter may hereafter be carried to.

The Steam Turbine and Marine Propulsion.

The above subject was discussed by Hon. Charles Parsons at the last meeting of the Institution of Naval Architects (British). The matter is of particular interest at this time, since the Turbinia, the first boat fitted with turbine engines, reached a speed on April 1 of 32.61 knots per hour (about 37½ statute miles). The turbine engines used were Parsons' compound, which have gradually been improved since 1885. In 1892 the compound turbine of this type showed a consumption of steam of 15.1 lbs. per indicated horse-power per hour, the boiler pressure being 100 lbs., and the steam superheated to 127 deg. Fahr. above the point of saturation. The Turbinia is 100 ft. in length, 9-ft. beam and 44½ tons displacement. The turbine engines were designed to develop about 1,500 actual horse-power at a speed of 2,500 revolutions per minute. The boiler which is now used is of the water-tube type built for 225 lbs. working pressure, and has a total heating surface of 1,100 sq. ft., and a grate surface of 42 sq. ft. The condenser has 4,200 sq. ft. of cooling surface. The main engines weigh 3 tons 13 cwt., and the total weight of machinery and boiler, screws and shafting and tanks is 22 tons. A preliminary trial showed that when running at a speed of 31.01 knots the consumption was approximately 25,000 lbs. per hour or 15.80 lbs. per indicated horse-power. The mean revolutions of the engine were 2,100 per minute and the boiler pressure was 200 lbs. per square inch, while the steam was used in the engines at 130 lbs. The indicated horse-power per ton of total machinery was 71.1. Mr. Parsons believes that even higher speed will yet be obtained, as will be seen by the following extract from the paper, "It should be observed that the assumption of the thrust horse-power being 60 per cent. of the indicated horse-power presupposes that the propellers are of the best form obtainable and should those now fitted be superseded by others of higher efficiency as is possible, and indeed probable, then the figures of consumption per indicated horse-power will be correspondingly improved, and the speed of the boat increased."

Launch of a New North German Lloyd Steamship. On May 4 the new twin-screw steamship Kaiser Wilhelm der Grosse, of the North German Lloyd Line, was launched at the yards of the Vulcan Shipbuilding Co., at Stettin, Germany. The dimensions of the vessel are: Length over all, 648 ft.; beam, 66 ft.; depth, 43 ft.; tonnage, 14,000, and displacement, 20,000 tons. She is divided into 18 water-tight compartments, and is fitted with bilge keels, and will carry 1,500 passengers.

Erie Track Elevation in Jersey City.

On Friday last, the plans for the elevation of the Erie Railroad through Jersey City having been approved, the contract between the city and the railroad company was duly signed and executed. Work is to be begun Nov. 1 next, and finished July 1, 1899. The plans adopted are those described in our issue of Jan. 29 of this year.

Rebuilding the Victoria Bridge.

Early in the year the report was current that the Grand Trunk contemplated certain changes in the Victoria Bridge at Montreal. We now learn that the contract for lengthening the piers and widening the abutments has been given to Mr. Wm. Gibson, of Beamsville, Ont. There are 24 piers, and these, together with the abutments, at present contain 100,000 cu. yds. of solid masonry. The new bridge will have two steam railroad tracks, and electric cars will be run over it. Provision will also be made for the passage of wagons and pedestrians. It is not definitely known what the Dominion government will do toward granting a subsidy.

Cast-Iron Car Wheels.

The Master Car Builders' Committee on Specifications and Guarantee for Cast-Iron Wheels asks information as to what, if any, modifications should be made in the present specifications adopted by the Master Car Builders' Association; also for anything special in the shape of wheel or tread which is considered an advantage; also the proper weight of wheels for various service required of them. The committee requests that all replies be sent in by May 10. Mr. J. N. Barr is Chairman.

Car Works in China.

A circular was recently sent out by the Imperial Railroads of China stating that new car works were about to be established, probably at Lupouchiao, 10 miles from Peking, when the work of building the Lapouchiao-

Hankow Railroad was begun. Catalogues and quotations for metal-working machinery were requested to be addressed to Y. T. Lin, Secretary, or C. W. Kinder, Engineer in Chief, Imperial Railroads, Tientsin, China. There are already works at Tientsin, where about 600 men are employed in building rolling stock for the Tientsin extensions. Axles, wheels and couplers are imported.

A Suburban Motor.

The Cincinnati, Hamilton & Dayton Traction Co. has ordered from the Baldwin Locomotive Works a steam motor, built somewhat on the lines of the Rowan motor now in use in Paris. It will be built by the Baldwins from their own specifications and designs, they not being restricted in any way by the Traction Company. It is believed that this will be a decided advance on anything heretofore done in this way.

The Simplon Tunnel.

The affairs of the Simplon tunnel seem to advance slowly, but it is believed that construction can be begun soon. The Swiss Confederacy has granted a subvention of 4,500,000 francs. Besides this the Jura-Simplon Company undertakes to get 10,500,000 francs from various cantons and other bodies. The Italian government, which will provide for building the Italian end of the line, gives to the Simplon Company an annuity of 66,000 francs during the concession, and, moreover, the provinces and cities interested are expected to aid in the enterprise. The present difficulty there, however, is that each locality wants to draw some special advantage from the line, and negotiations are necessary to decide upon its exact route.

Electric Roads in Russia.

It seems that there is likely to be considerable development of electric railroads in Russia. There is one already established at Kief and one at Nijni-Novgorod. These were built by Germans, but are worked by Russian companies. A Finnish company acquired a charter for building an electric road in Sebastopol and also for electric lighting, but this has been turned over to a Belgian company established by Chandoi & Cockerill. This company is negotiating for rights to build electric roads in at least four other places.

THE SCRAP HEAP.

Notes.

On the Grand Trunk the conductors of the through passenger trains now run through between Chicago and Port Haron, 335 miles.

The annual convention of the Order of Railway Conductors is to be held in Los Angeles, Cal., next week, and about 45 Pennsylvania Railroad conductors will attend it, leaving Philadelphia by a special train on May 8.

On April 28 a special train carrying copies of the Chicago Times-Herald was run from Chicago, Ill., to Nashville, Tenn., 441 miles, in 8 hours 44 minutes, equal to 59.8 miles an hour. This is about five hours quicker than the time of the fastest regular train. The special train left Chicago at 3:58 a. m., Danville Junction, 6:10; Terre Haute, 183 miles, 7:45, and arrived in Nashville at 12:42. The route was over the Chicago & Eastern Illinois, the Evansville & Terre and the Louisville & Nashville.

Fire Extinguishers in Passenger Trains.

The Railroad Commissioner of Ohio, after testing nine different kinds of fire extinguishers, has issued to the railroads a circular prescribing regulations, under the law recently passed in that state, for the use of such extinguishers in passenger cars. According to the law the equipment of trains is to be gradual, one car in each train being first supplied. The Commissioner recommends that this first extinguisher be placed in the ladies' car. It must be in plain sight and easily accessible. The principal requirements are: An extinguisher using gas or compressed air as a propelling force, which will sustain hydraulic pressure of 300 lbs. without distortion; so constructed as to admit of a practical test at any time to ascertain its efficiency; using non corrosive and harmless chemicals; not to be affected by jolting and slight collisions, a machine with a capacity of not less than 2½ gals. of fluid, and throwing a stream at least 25 ft.; and one that will not be affected by a continued temperature of 10 deg. below zero.

Launching of the Princess Anne.

The new vessel for the Old Dominion Steamship Co., the Princess Anne, was launched at the yards of the Delaware River Iron Ship Building & Engine Works, Chester, Pa. The new vessel will be the largest in the company's service, being 315 ft. long, 42 ft. beam, with 27 ft. depth of hold. The tonnage will be over 3,000 tons. She will be fitted with triple-expansion engines, with cylinders 27½ x 44½ x 73 x 54 in. and will have four boilers, each 14 ft. 3 in. in diameter by 12 ft. long. She will have a grate surface of 300 ft. and a heating surface of 10,000 sq. ft., which is expected to develop 3,400 H. P., giving her a speed of nearly 17 knots. A single stack will reach 80 ft. from the grates, the company preferring natural to forced draught. The new steamer will have accommodations for 120 first-cabin and 25 steerage passengers.

Lake Note.

Two steel whaleback tow barges, which were lengthened from 190 ft. to 251 ft., were launched by the American Steel Barge Co., at West Superior, Wis., May 1. The barges were originally built by the Erie Basin Dry Dock Co., of Brooklyn, N. Y., as an experiment for ocean traffic. Their carrying capacity has been increased from 1,600 to 2,000 gross tons. They draw 14½ ft. of water.

The Mississippi Floods.

A circular relating to the Mississippi River floods, issued by the Department of Agriculture on April 22, gives as the total area submerged at that date over 20,000 sq. m. It contained at the last census 46,925 farms, with a total area of 4,944,476 acres, nearly one-half of which was improved, and a total population, agricultural and other, of 462,041. The value of its farms,

farm buildings, and farm machinery, according to the census of 1890, together with the value of its live stock on Jan. 1 last (\$9,174,636), and of its products of last season still on hand on March 1 last (\$4,595,179) is \$90,176,177, a total which represents the approximate value of the agricultural property of the submerged region. Among the products of this region last year were 466,056 bales of cotton, worth \$16,312,060; 12,525,645 bu. of corn, worth \$3,995,278, and 9,083,878 lbs. of sugar worth \$271,016, the total production, including minor crops, representing a value of \$21,782,180 on the plantation. The estimated population of the flooded district is 17,275 whites and 65,081 colored, a total of 82,356.

Annual Report of the General Electric Co.

Mr. C. A. Coffin, President of the General Electric Co., has made the following report of the business of the company for the year ending Jan. 31, 1897:

Gross earnings	\$12,820,395.87
Less expenses	11,207,388.65
	\$1,613,007.22
Deduct:	
Interest on debentures*	\$131,250.00
Less interest and discount, and interest and dividends received on securities owned	370,479.70
	60,770.30
	\$1,552,236.92
Deduct amounts written off:	
Sundry losses and allowances for possible losses	\$318,531.13
Patents	\$49,919.20
Inventories and consignments	61,084.33
	\$729,534.66
Less:	
Profit on securities sold and debentures cancelled	136,935.85
	\$592,578.81
Re-duction of the deficit of previous years	\$959,658.08

*On \$8,750,000 for 10 months and on \$8,000,000 for two months

Nothing is mentioned in the above report in regard to the provisions for dividend resumption, but the company has enlarged its plant and retired \$750,000 of its debenture bonds without increasing its obligations. The company has now outstanding \$8,000,000 of debenture bonds.

The Tennessee Centennial Exposition.

The Tennessee Centennial and International Exposition was opened at Nashville, on May 1. Many of the special features were mentioned in the Railroad Gazette Feb. 26 of the current year, and the Commerce, Transportation and other buildings were there illustrated. The Agricultural Building is one of the most attractive of the group, its general features being shown in the accompanying engraving, reproduced from a photograph, which was taken when the building was nearly completed. The installation of power consists in the main of the following machinery: In the boiler-room there are four 500-H. P. and two 250-H. P. Climax boilers, which were rented from the builders by the Exposition at \$5 per horse-power. These were built to carry 120 lbs. pressure. The steam is delivered to the engines, which are in a separate building, by means of a 10-in. pipe. Four Westinghouse compound engines furnish power



for electric lighting and power. These engines are non-condensing 18 and 36 x 16 in., rated at 400 H. P. each and belted to two, and in one case to three, generators placed on the same floor. The generators are of the Brush, Western Electric and General Electric patterns. In the Machinery building there is one 500 H. P. Hamilton-Corliss engine and a Lane & Bodley Corliss engine rated at 400 H. P. Machinery Hall will also contain a 100 H. P. Weston engine direct connected to an 80 KW. Triumph generator and a 150 H. P. Phoenix engine belted to a 100 KW. Weston electric generator. This entire department is under the management of Capt. George Reyer, Superintendent of the Water-Works at Nashville.

Floods in Iowa and Elsewhere.

The railroads of Iowa have had much trouble from the recent floods, as has been noted from time to time in these columns, but it is difficult to obtain reliable information as to the extent of the damage and the condition of the tracks until after the water has receded sufficiently to permit of a careful inspection. On the Chicago, Burlington & Quincy the effects of the high water on the main line and principal branches may be briefly described as follows:

Up to about 11 o'clock on the night of April 26 the main line between Chicago and Denver was open for the passage of trains, but after that time communication was cut off on account of a very rapid rise in the Des Moines River. Before the water subsided three miles of track west of Ottumwa was submerged, making the road impassable at that point for about 36 hours. In the mean time the Omaha and Denver trains were operated over the company's Hannibal & St. Joseph line. No bridges, either metal or wooden, were seriously damaged. In addition to the high water at Ottumwa there were several small washouts at points in Iowa further west on the main line, but the delays to traffic at these points were but a few hours in each instance.

On the Chariton & St. Joseph Branch there was about one mile of track washed out which delayed trains for about three days, but no damage was done to bridges. The most serious trouble occurred on the Creston & Hopkins Branch, where the track was washed away for a distance of eight miles, two miles being washed entirely off of the embankment. It was seven days before trains were again running over this division.

The foregoing is from an officer of the road. A Chicago press dispatch states that the losses of the Burlington in Iowa are about \$150,000, which, presumably, is a very rough estimate. The same dispatch is authority for the statement that the Chicago, Milwaukee & St. Paul lost a similar sum in Iowa.

A sudden flood in the Cottonwood River, at Guthrie, Okla., on April 28, in which a considerable number of persons were drowned, damaged the tracks of the

Atchison, Topeka & Santa Fe to such an extent that traffic was suspended four or five days. It is stated that the money loss to the railroad company was \$10,000.

On April 25, considerable damage was done by floods in the region of Beatrice, Neb., the Union Pacific, the Rock Island and the Burlington having tracks flooded and suffering some damage to culverts and small bridges.

Purchase of the Liverpool Street Railroads.

According to the *Railway World*, the Liverpool Corporation and the Tramways Company have come to an agreement whereby the city secures possession of 66½ miles of street railroad. The price to be paid is said to be \$61.85 for each \$50 share, which is \$3.12 above the market quotation previous to the sale. The price thus arranged to be paid amounts to \$2,838,800, and in return for this amount the company turns over to the corporation the tramway lines, 281 cars, 156 omnibuses and 3,002 horses. The percentage of working expenses to receipts is now about 85.45 per cent., so that there may be room for improvement, and a large increase in traffic is expected as soon as better cars and higher speed are obtained.

Express Service to Gibraltar.

The news that the bi-weekly southern express train from Paris to Madrid will in future be continued as far as Gibraltar has a significance which ought not to be overlooked. It means that Gibraltar will be converted into the principal port of call for the great steamship lines between Europe and South Africa, in place of Lisbon. Should the scheme become an accomplished fact it will be a serious blow to the Portuguese capital, whose prosperity is largely bound up with its steamship traffic.—*Transport.*

LOCOMOTIVE BUILDING.

The Mobile & Ohio has placed an order with the Rogers Locomotive Co. for 15 10-wheel engines.

The Baltimore & Ohio has placed an order with the Baldwin Locomotive Works for 25 engines.

Six new freight engines are being built at the shops of the Chicago, Rock Island & Pacific Railroad.

The Cooke Locomotive & Machine Co., of Paterson, N. J., has received an order for two locomotives from Japan.

The Baldwin Locomotive Works has received an order to build six locomotives for the government railroads of South Africa.

The Richmond Locomotive & Machine Works has received an order for one engine from the New Orleans & Northeastern Railroad.

It is stated that the Schenectady Locomotive Works has received an order for 12 heavy locomotives from the Northern Pacific, duplicates of the one described in our issue of Feb. 26, 1897.

The Sung-Wu railroad, now under construction from Woosung to Shanghai, China, a distance of about 30 miles, has placed an order with the Brooks Locomotive Works, of Dunkirk, N. Y., for three locomotives.

The Denver & Rio Grande is building at its Burnham shops, Denver, Col., two locomotives, duplicates of two built by the Baldwin Locomotive Works about two months ago. These are the first locomotives to be built at these shops.

CAR BUILDING.

It is reported that the Buffalo, Rochester & Pittsburgh will build 200 cars at its shops.

It is officially denied that the Seaboard Air Line contemplates ordering any new cars at present.

It is stated that the Pullman Palace Car Co. has received an order to build a private car for President Diaz, of Mexico, to cost \$40,000.

BRIDGE BUILDING.

Ada, Mich.—The township boards of this place and of Plainfield will ask for bids, at once, for new bridges across the Grand River.

Allentown, Pa.—The County Commissioners have given the contract for two iron bridges over Jordan Creek in Lowhill Township to Pascoe & Crilly at \$4,165.

Bessemer, Pa.—The contract for a railroad bridge to connect the tracks of the Pittsburgh, Bessemer & Lake Erie, which are on the north and south sides of the Monongahela River, will probably be let in the near future.

Birmingham, Ala.—The Hanover Construction Co., the general contractor for the Montgomery, Tuscaloosa & Memphis, an extension of the Mobile & Ohio, has let the contracts for masonry for five iron bridges on this extension to Watkins & Hardaway, of this place, at \$135,000. The bridges will be at Montgomery, Tuscaloosa, Centreville and Sipsey, Ala., and Columbus, Miss.

Boston, Mass.—The Boston Transit Commissioners received the following bids for building eight spans of steel superstructure for the new Charlestown bridge: A. & P. Roberts Co., \$75,196; Boston Bridge Works, \$81,000; Carnegie Steel Co., \$83,340; Edge Moor Bridge Works, \$83,883; Pennsylvania Steel Co., \$88,660; New Jersey Steel & Iron Co., \$91,980; Toledo Bridge Co., \$93,540; King Bridge Co., \$99,980; Union Bridge Co., \$102,300; New Columbus Bridge Co., \$107,260; Penn Bridge Co., \$108,360; Wrought-Iron Bridge Co., \$109,800. The contract was awarded to A. & P. Roberts Co. at their bid of \$75,196.

Brooklyn, N. Y.—Bids as follows have been received by the Joint Committee of the Brooklyn Board of Aldermen and the Queens County Board of Supervisors for the building of the bascule bridge over Newtown Creek, between Manhattan avenue, Brooklyn, and Vernon avenue, Long Island City: King Bridge Co., \$273,000; T. & A. Walsh, \$285,000; M. J. Dady, \$289,700; Stephens & O'Rourke, \$294,000; Charles Hart, \$363,000; Oswego Bridge Co., \$395,000.

Clarksburg, W. Va.—The town authorities of this place will build an iron and steel bridge across the Elk River at the foot of one of the new streets.

Great Falls, Mont.—The Great Falls & Canada intends to rebuild all bridges and culverts on its line.

Harrisburg, Pa.—A bill providing for the building of a free bridge at the foot of Market street, Lewisburg has passed through the House and Senate, and awaits the signature of the Governor.

Kingston, Tenn.—The County Court has recommended the building of a 650-ft. steel bridge over the Clinch River, at an estimated cost of \$50,000.

London, Ont.—The City Engineer has recommended

that tenders be asked for a steel bridge and sewer viaduct across the river at King street.

Pittsfield, Mass.—A petition for a new bridge over the Housatonic Railroad tracks has been presented to the City Council, and referred by it to a committee.

Providence, R. I.—Bids are asked until May 15 for a steel highway bridge over the Providence River, to replace the present Weybosset bridge. Plans and specifications may be seen at the office of the City Engineer, where blank forms of contract, proposal and bonds may be obtained. Robert E. Smith, Commissioner of Public Works.

Rockport, Ind.—Bids are asked until May 13 for a bridge across Honey Creek, Hammond Township. C. H. Wright is Chairman of the Board of County Commissioners.

St. Stanislaus de Batiscau, Que.—The bridge across the Batiscan River, which has been carried away by floods, will be rebuilt immediately.

Shamokin, Pa.—It has been decided to recommend to the Grand Jury the early building of the overhead bridge at Cameron Colliery. The Philadelphia & Reading and Northern Central, it is said, will bear their share of the \$24,000 estimated cost of the structure.

Toledo, O.—Tenders are asked until May 20 for building the substructure of a bridge over Swan Creek. Chas. H. Jones, County Auditor.

Yorkville, S. C.—The site for a bridge over the Catawba River has been selected at Harris Ferry, and plans and specifications, upon which bids will be advertised for, will soon be ready.

West Chester, Pa.—The Grand Jury has recommended to the County Commissioners the building of a bridge over Muddy Run in Lower Oxford Township.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Elmira & Williamsport, 2½ per cent., payable May 1.

Kansas City, St. Louis & Chicago, quarterly, 1½ per cent., guaranteed on preferred stock, payable May 1.

Lehigh Coal & Navigation Co., 2 per cent., payable May 27.

North & West Branch, 3 per cent., payable May 1, also extra dividend 1 per cent., payable May 1.

Pennsylvania, semi-annual, 2½ per cent., payable May 31.

Pittsburgh, Virginia & Charleston, 2½ per cent., payable May 1.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Burlington, Cedar Rapids & Northern, annual, Cedar Rapids, Ia., May 25.

Chateaugay, annual, Plattsburgh, N. Y., May 29.

Chicago, St. Paul, Minneapolis & Omaha, annual, Hudson, Wis., June 5.

Delaware & Hudson Canal Co., annual, 21 Cortland street, New York, May 11.

Delaware, Maryland & Virginia, annual, Georgetown, Del., May 26.

Des Moines & Fort Dodge, annual, Des Moines, Ia., June 3.

Flint & Pere Marquette, annual, Saginaw, Mich., May 19.

Lake Shore & Michigan Southern, special, Cleveland, O., and Erie, Pa., May 24.

Missouri, Kansas & Texas, annual, Parsons, Kan., May 19.

New York Central & Hudson River, special, Albany, N. Y., May 26.

New York & Harlem, annual, Grand Central Depot, New York City, May 18, and special meeting at the same time and place.

Northern (New Hampshire), annual, Concord, N. H., May 27.

Susquehanna Canal Co., general, Reading Terminal, Philadelphia, Pa., May 10.

Syracuse, Geneva & Corning, annual, Watkins, N. Y., May 13.

General Electric Co., annual, Schenectady, N. Y., May 11.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *National Convention of Railroad Commissioners* will be held at St. Louis, Mo., on May 11, 1897.

The *American Society of Mechanical Engineers* will hold its semi-annual meeting at Hartford, Conn., May 25 to 28.

The *Association of American Railway Accounting Officers* will hold a convention at Richmond, Va., on May 26, 1897.

The *Association of Railroad Claim Agents* will hold their next meeting at the Southern Hotel, St. Louis, May 26, 1897.

The *Association of Railway Claim Agents* will hold its convention at St. Louis, Mo., during the last week of May, 1897.

The *Canadian Electrical Association* will hold its convention at Niagara Falls, Ont., June 2, 3 and 4.

Hotel Lafayette will be the headquarters of the association.

The *Master Car Builders' Association* will hold its annual convention at Old Point Comfort, Va., beginning June 8, 1897.

The *National Association of Local Freight Agents' Associations* will hold a convention at Washington, D. C., on June 8, 1897.

The *American Railway Master Mechanics' Association* will hold its annual convention at Old Point Comfort, Va., beginning June 15, 1897.

The *National Association of Car Service Managers* will hold a convention at Boston, Mass., on June 16, 1897.

The *Association of Railway Telegraph Superintendents* will hold a convention at Niagara Falls, N. Y., on June 16, 1897.

The *Ohio State Tramway Association* will hold its next meeting at Columbus, O., on June 15.

The *Train Despatchers' Association of America* will hold a convention at Detroit, Mich., on June 22, 1897.

The *American Society of Civil Engineers* meets at the House of the Society, 127 East Twenty-third street, New York, on the first and third Wednesdays in each month, at 8 p. m.

The *Association of Engineers of Virginia* holds in formal meetings on the third Wednesday of each month, from September to May, inclusive, at 710 Terry Building, Roanoke, at 5 p. m.

The *Boston Society of Civil Engineers* meets at 715 Tremont Temple, Boston, on the third Wednesday in each month, at 7:30 p. m.

The *Canadian Society of Civil Engineers* meets at its rooms, 113 Mansfield street, Montreal, P. Q., every alternate Thursday, at 8 p. m.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

The *Civil Engineers' Club of Cleveland* meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month, at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

The *Civil Engineers' Society of St. Paul* meets on the first Monday of each month, except June, July, August and September.

The *Denver Society of Civil Engineers* meets at 3 Jacobson Block, Denver, Col., on the second Tuesday of each month except during July and August.

The *Engineering Association of the South* meets on the second Thursday in each month, at 8 p. m. The Association headquarters are at The Cumberland Publishing House, Nashville, Tenn.

The *Engineers' and Architects' Association of Southern California* meets each third Wednesday of the month in the Hall of the Chamber of Commerce, Los Angeles, Cal.

The *Engineers' and Architects' Club of Louisville* meets in the Norton Building, Fourth avenue and Jefferson street, on the second Thursday each month at 8 p. m.

The *Engineers' Club of Cincinnati* meets at the rooms of the Literary Club, No. 25 East Eighth street, Cincinnati, O., on the third Thursday in each month, at 7:30 p. m. Address P. O. Box 333.

The *Engineers' Club of Columbus, (O.)*, meets at 12½ North High street, on the first and third Saturdays from September to June.

The *Engineers' Club of Minneapolis* meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

The *Engineers' Club of Philadelphia* meets at the House of the Club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month, at 8 p. m., except during July and August.

The *Engineers' Club of St. Louis* meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

The *Engineers' Society of Western New York* holds regular meetings the first Monday in each month, except in the months of July and August, at the Buffalo Library Building.

The *Engineers' Society of Western Pennsylvania* meets at 410 Penn avenue, Pittsburgh, Pa., on the third Tuesday in each month, at 7:30 p. m.

The *Montana Society of Civil Engineers* meets at Helena, Mont., on the third Saturday in each month, at 7:30 p. m.

The *New England Railroad Club* meets at Wesleyan Hall, Bromfield street, Boston, Mass., on the second Tuesday of each month.

The *New York Railroad Club* meets at 12 West Thirty-first street, New York City, on the third Thursday in each month, at 8 p. m.

The *North-West Railway Club* meets on the first Tuesday after the second Monday in each month, at 8 p. m., the place of meeting alternating between the West Hotel, Minneapolis, and the Ryan Hotel, St. Paul.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2:30 p. m.

The *Railway Signalling Club* will meet on the second Tuesday of the months of January, March, May, September and November, in Chicago.

The *St. Louis Railway Club* holds its regular meeting on the second Friday of each month, at 3 p. m.

The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *Technical Society of the Pacific Coast* meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

The *Western Foundrymen's Association* meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. A. Sorge, Jr., 1533 Marquette Building, Chicago, is secretary.

The *Western Railway Club* meets in Chicago on the third Tuesday of each month, at 2 p. m.

The *Western Society of Engineers* meets in its rooms on the first Wednesday of each month, at 8 p. m., to hear reports, and for the reading and discussion of papers. The headquarters of the Society are at 1736-1739 Monadnock Block, Chicago.

Railway Signalling Club.

The Railway Signalling Club will hold its next regular meeting Tuesday evening, May 11, at the Great Northern Hotel, Chicago. The paper presented at the last meeting by Mr. H. M. Sperry, entitled "Signal Problems," will be discussed. The committee appointed some time ago will report on "Rules of Interlocking, Operation and Maintenance," and the rules proposed will come up for discussion. The names of a number of candidates for membership will be proposed.

Engineers' Society of Western New York.

At the regular meeting held at Buffalo, N. Y., May 3, Mr. R. S. Buck delivered an informal address on the subject of "American Bridge Practice." Mr. Buck is engineer in charge of construction of the Niagara gorge railroad steel arch bridge, and his remarks were confined chiefly, in a general way, to the work at this locality, beginning with the construction of the first suspension bridge. A large number of handsome progress photographs of the new structure were exhibited.

Central Railway Club.

The next regular meeting of the club will be held at the Hotel Iroquois, Buffalo, on Friday, May 14, 1897, at 2 p. m. The reports will be on "Brick Arches in Locomotive Fire Boxes." Committee—F. B. Griffith, George Hazleton, E. P. Mooney, A. E. Mitchell, George W. West; and on "Steel Shapes for Trucks; Best Method Rolled or Pressed." Committee—H. H. Hewitt, James B. Brady, Charles T. Shoen, John W. Cloud.

The discussion will be on "Piece Work in Car Repairs." Committee—H. C. McCarthy, Thomas Anderson, John S. Lentz, J. R. Petrie, Robert Gunn; and amendments to the constitution and by-laws proposed by Robert Potts and H. C. McCarthy, also topical questions proposed by members.

New York Railroad Club.

The closing meeting of the season will be held at Mendelssohn Hall, 119 West Fortieth street, New York City, May 20, at 8 o'clock p. m. This is also the twenty-fifth anniversary of the formation of the club, and admission will be by card only. A paper on "The Condition: Which Influence the Life of Track" will be read by Mr. F. R. Coates, Roadmaster N. Y., N. H. & H.

A circular has been issued to the members stating that the Old Dominion Steamship Co. will convey members of the club and their families from New York to Old Point Comfort for \$5 each for the conventions of the Master Car Builders' and Master Mechanics' Asso-

ciations. This same rate will be good returning, and includes transportation, state room, and meals.

American Society of Mechanical Engineers.

A meeting of the American Society of Mechanical Engineers will be held in Hartford, Conn., May 25 to 28, inclusive. The headquarters will be at the Allyn House and the sessions will be held at Unity Hall, 26 Pratt street. The first session will be Tuesday evening, May 25, at which the Mayor will give an address of welcome with a response by the President, and there will be an informal reception afterward. Wednesday morning there will be a general business session and Wednesday afternoon there will be visits to the works of the Pope Company, the Billings & Spencer Co., the Hartford Rubber Works, Pope Tube Works, Pratt & Whitney and the Motor Carriage Works. Wednesday evening there will be a general reception given to the society by Trinity College. Tuesday morning there will be a session for papers and discussions, and in the afternoon there will be visits to some of the shops mentioned above, by detachments who did not visit them on Wednesday. In the evening there will be a session for a professional paper, and on Friday morning there will be further reading of papers. Friday afternoon visits will be made to the Colt's Works and an excursion by invitation of Mr. Hall down the Connecticut River to the brownstone quarries of the Brainerd, Shailer & Hall Quarry Co., at Portland. Friday evening there will be a session for further professional papers and for concluding business. The list of papers and their authors follow:

Jones, Forrest R.: Diagrams for Relative Strength of Gear Teeth.

Cole, F. J.: Experiments in Boiler Bracing.

Wood, De Volson: Adiabatics.

Bedell, Frederick A.: New Form of Transmission Dynamometer.

Hale, R. S.: Fuel Gas Analysis in Boiler Tests.

Carpenter, R. C.: Hygrometric Properties of Coals.

Benjamin, Chas. H.: Electricity versus Shafting in the Machine Shop.

Jackson, D. C.: Electrical Power Equipment for General Factory Purposes.

Schumann, Francis: Volumetric Contraction of Cast Iron.

Aldrich, W. S.: On Rating Electrical Power Plants Upon the Heat-Unit Standard.

Rice, A. L.: The Laws of Cylinder Condensation.

Hill, H. A.: Tests of Sulzer Engines.

Lane, H. M.: Method of Accounting to Determine Shop Cost and Selling Price.

Waldo, Leonard: History and Development of the Bicycle.

Henning, Gus C.: A Pocket Recorder for Tests of Materials.

Henning, Gus C.: A Mirror Extensometer.

Gray, Thomas: The Effect of Alternate Positive and Negative Stresses in Iron and Steel.

Gray, Thomas: The Yield Point in Iron and Steel.

Jacobus, D. S.: An Apparatus for Accurately Measuring Pressures of Ten Thousand Pounds per Square Inch and over.

Jacobus, D. S.: Tests to Show the Influence of Moisture in Steam on the Economy of a Steam Turbine.

PERSONAL.

—Mr. George Schroeder has been chosen Manager of the Milwaukee Freight Bureau.

—Mr. Frank H. Kram has been appointed Agent of the Lehigh Valley at Wyalusing, Pa.

—Mr. T. C. Purdy, Vice-President and General Manager of the Missouri, Kansas & Texas, has resigned.

—Mr. A. M. Patch has been elected Treasurer of the Cornwall Railroad, to succeed David S. Hammond, deceased.

—Mr. Henry W. Borntraeger, Vice-President of the Pittsburgh Bridge Co., died at his home in Pittsburgh, Pa., on April 30.

—Mr. George H. Dolson has been appointed Local Freight and Passenger Agent of the Ann Arbor, at Menominee, Mich.

—Mr. H. Roberts, Master Mechanic of the Western Division of the Grand Trunk, with headquarters at Ft. Gratiot, Mich., has resigned.

—Mr. T. H. Fitzpatrick, Division Superintendent of the Union Pacific, Denver & Gulf, with headquarters at Cheyenne, Wyo., has resigned.

—Mr. J. B. Nelson has been appointed Treasurer of the Missouri, Kansas & Texas, of Texas, with headquarters at Dallas, to succeed Mr. J. F. Daley.

—Mr. Joseph M. Black, Chief Clerk to the General Traffic Manager of the Michigan Central, with office at Detroit, Mich., died at that place on April 27.

—Mr. O. P. Dunbar, formerly General Master Mechanic of the Wheeling & Lake Erie, has been appointed Superintendent of Motive Power and Rolling Stock of that company.

—Mr. L. A. Boyd, formerly Trainmaster of the Southern, at Columbia, S. C., has been appointed Trainmaster of the Seaboard Air Line, at Abbeville, S. C., to succeed Mr. C. W. Hinsdale.

—Mr. G. S. Gatchell, of Buffalo, N. Y., has been appointed an Inspector of the Board of Railroad Commissioners of the State of New York, to succeed Mr. Frank K. Baxter, resigned.

—Mr. M. J. McGarvey has been appointed Agent of the Buffalo, Rochester & Pittsburgh, at Summit, N. Y., to succeed Mr. A. J. McVean, transferred. The appointment took effect April 29.

—Mr. J. A. Flanders has been appointed New England Passenger and Freight Agent of the Plant System, with office at 290 Washington street, Boston, Mass., to succeed Mr. Edward Sands, resigned.

—Mr. J. Cullinan, formerly Master Mechanic of the Norfolk & Western, at Portsmouth, O., has been appointed Foreman of the shops at that place, and his former office has been abolished.

—Mr. J. W. Moore, of Norfolk, Va., has been appointed General Freight and Passenger Agent of the Carolina & Northwestern, with headquarters at Lenoir, N. C., to succeed Mr. S. T. Pender, deceased.

—Mr. A. S. White, General Manager of the Erie Despatch, with headquarters in Cleveland, O., has resigned, to become Traffic Manager of the American Tobacco Co. His resignation will take effect May 15.

—Mr. W. J. Van Arsdale, for a number of years at the head of the department of real estate claims and taxes of the New York Central & Hudson River, died suddenly at his home in New York City on April 30.

—Mr. O. D. Ball, Jr., has been appointed General Purchasing Agent of the Seaboard Air Line, with headquarters at Portsmouth, Va., to succeed Mr. John Warwick, resigned. The appointment took effect May 1.

—Mr. H. de Vaison Pratt, who from 1864 until 1873 was connected with the Erie Railroad, first as Superintendent of the Susquehanna Division and later as General Manager, died at Elmira, N. Y., on May 4. He was 76 years old.

—Mr. M. Spaulding, Supervisor of the Pennsylvania, with headquarters at Warren, Pa., has resigned, and was succeeded on May 1 by Mr. G. B. Roberts. Mr. Spaulding was connected with the Pennsylvania for 40 years.

—Mr. F. S. McCormick, formerly Chief Clerk to Freight Traffic Manager Munroe, of the Union Pacific, has been appointed Agent of the Freight Department of the company at Sacramento, Cal., to succeed Mr. F. B. Choate, transferred.

—Mr. Delano Luce, formerly Chief Clerk in the Passenger Department of the Pittsburgh & Lake Erie, has been appointed District Passenger Agent of the Great Northern at Pittsburgh, to succeed Mr. C. C. Mordough, resigned to enter other service.

—Mr. E. E. Gold, President of the Gold Car Heating Co., of New York City, sailed for Europe on the Majestic, Wednesday, May 5. Mr. Gold will visit a number of large cities in Great Britain and the Continent, returning to this country about the middle of June.

—Mr. W. O. Sprigg, whose resignation as Superintendent of the Staten Island Rapid Transit Railroad was noted in these columns last week, has been appointed Assistant Superintendent of the Third Division of the Southern Railway. The appointment took effect May 1.

—Mr. George M. Cumming, who has been elected First Vice-President of the Erie Railroad, which position has been vacant since the reorganization, was appointed General Solicitor of the company, July 1 last. Mr. Cumming was at one time connected with the law department of Columbia University.

—Mr. William W. Rossiter, President of the Terminal Warehouse Co., of New York, died at the Seney Hospital in Brooklyn, on April 30. Mr. Rossiter was a brother of C. L. Rossiter, President of the Brooklyn Heights Railroad, and of E. V. W. Rossiter, Treasurer of the New York Central & Hudson River.

—Mr. B. D. Boggs, formerly Chief Clerk to General Freight Agent Bail, of the Philadelphia & Reading, has been appointed Division Freight Agent of the company, with headquarters in Harrisburg. He succeeds Mr. George S. Costa, who resigned to become General Manager of the recently organized Blue Ridge Despatch.

—Mr. A. C. Knapp, died at his home in Macon, Ga., on April 27, after a long illness. Mr. Knapp was for several years Agent of the Central of Georgia, at Macon, and was also at one time Superintendent of the Southwestern of Georgia. In July, 1890, he became General Freight and Passenger Agent of the Georgia Southern & Florida, and was subsequently appointed Traffic Manager of the same road, with headquarters at Macon.

—In the May issue of the *American Engineer, Car Builder and Railroad Journal* the announcement is made that Mr. George M. Basford has now taken editorial charge of that journal. Mr. Basford has been for some years Associate Editor of the *Railway Review* of Chicago, and has recently been Secretary of the Western Railway Club. The announcement is also made that Mr. M. N. Forney now retires definitely from editorial work.

—Mr. A. A. Allen, formerly Assistant General Manager of the Missouri, Kansas & Texas, has been appointed Vice-President and General Manager of the company to succeed Mr. T. C. Purdy, resigned. The appointment took effect May 1. Mr. Allen entered railroad service in July, 1868, and filled various subordinate positions until June, 1882, when he was appointed a Division Superintendent of the Wisconsin Central. He was appointed General Superintendent of the Missouri, Kansas & Texas in January, 1893, and held that position until February, 1895, when he was made Assistant General Manager.

—Mr. John S. Wilson has been elected President of the Baltimore, Chesapeake & Atlantic, to succeed Mr. John E. Searles, who has resigned. Mr. Wilson entered railroad service as Solicitor for the Baltimore & Ohio in 1862; he afterward became General Freight Agent of the Philadelphia, Wilmington & Baltimore, holding that position from 1870 to 1882. He was appointed Freight Traffic Manager of the Pennsylvania in 1882 and held that position until 1889, when he became President of the Central New England & Western. He remained in this last position until 1892, when the road became a part of the Philadelphia, Reading & New England. Mr. Searles will remain Chairman of the Board.

—Mr. C. G. Eckstein, who has long been the agent in New York for the Cockerill Company (of Seraing, Belgium), will sail for Europe about June 15. He goes abroad for the purpose of introducing American machine specialties in Germany, and his present expectation is to do a good deal in the way of compressed air tools. He intends to open an office in Berlin and another in Dortmund. He will continue his office in New York City. Mr. Eckstein is widely and well known in Germany as well as in America. He has long been the agent here for one of the most important houses in Belgium, and he has excellent connections abroad. We should suppose therefore that he undertakes this new enterprise with excellent prospects of success.

ELECTIONS AND APPOINTMENTS.

Baltimore & Ohio Southwestern.—W. H. Brimson has been appointed Superintendent of the Ohio Division, with headquarters at Chillicothe, O., to succeed C. H. Howard, appointed Superintendent of Terminals in Cincinnati. The headquarters of E. R. Scoville, Trainmaster of the Ohio Division, have been transferred from Cincinnati to Chillicothe. John Hair has been appointed Division Master Mechanic of the Ohio Division, with headquarters at Chillicothe, to succeed T. G. Duncan, resigned.

Baltimore, Chesapeake & Atlantic.—John S. Wilson has been elected President of the company to succeed John E. Searles, resigned. Mr. Searles will remain Chairman of the Board of Directors.

Carabelle, Tallahassee & Georgia.—W. E. McCarthy has been appointed Master Mechanic, with headquarters at Lanark, Fla., to succeed S. A. Sheppard, deceased. In addition to his duties as Master Mechanic he will have charge of the renewal and repairs of rolling stock and equipment. The appointment took effect May 1.

Central of Georgia.—J. M. Barnard, Jr., having resigned, the position of General Agent at Savannah has been abolished, and employees who have heretofore re-

ported to the General Agent will now report to the Vice-President at Savannah.

Central Ohio.—At the annual meeting held at Columbus, O., April 28, officers were elected as follows: President, J. H. Collins; Secretary, P. C. Sneed; Treasurer, W. H. Ijams; Auditor, G. W. Booth.

Chicago, Milwaukee & St. Paul.—E. X. Hastings, formerly Superintendent of Terminals at Milwaukee, Wis., has been appointed Superintendent of the Prairie du Chien Division, with headquarters at Milwaukee, to succeed W. W. Collins, promoted. H. Earling has been appointed Superintendent of Terminals at Milwaukee, to succeed Mr. Hastings. F. N. Bagley has been appointed Trainmaster of the La Crosse Division, to succeed Mr. Earling.

Erie.—George M. Cumming has been elected First Vice-President, with office at 21 Cortlandt street, New York City.

Kanona & Prattsburgh.—Officers of the new company have been elected as follows: President, L. V. F. Randolph, 39 William street, New York; Vice-President and Treasurer, I. W. Fowler, Prattsburgh, N. Y.; Secretary, John J. Cahill, 39 William street, New York; Superintendent, C. Hallagan, Jr., Prattsburgh, N. Y.

Mead Run.—The directors of this company, recently incorporated in Pennsylvania, are: Elisha K. Kane, President; Thomas L. Kane, A. B. Cody, R. B. Cody, A. E. Foster, W. E. Bradley and L. J. Kepler, all of Kushequa, Pa.

Missouri, Kansas & Texas.—A. A. Allen, formerly Assistant-General Manager, has been appointed Vice-President and General Manager of the company, to succeed T. C. Purdy, resigned. Mr. Allen's appointment took effect May 1. The office of Assistant General Manager has been abolished.

Missouri Pacific.—The local offices of this road and of the St. Louis, Iron Mountain & Southern, and the Texas & Pacific, at New Orleans, La., have been consolidated, and S. G. Miller, formerly Local Freight Agent of the Texas & Pacific has been put in charge, with the title of General Agent.

New York Central & Hudson River.—The Board of Directors has elected the following officers: Chairman of the Board, Cornelius Vanderbilt; President, Chauncey M. Depew; First Vice-President, Charles C. Clarke; Second Vice-President, Horace J. Hayden; Third Vice-President, H. Walter Webb; Treasurer, E. V. W. Rossiter; Secretary, E. D. Worcester.

North Brookfield.—At the annual meeting held on May 1, officers were elected as follows: President, Theodore C. Bates; Vice-President, Alden Batchelder; Treasurer, John B. Dewing; Clerk, George R. Harnant.

Pennsylvania.—The following appointments have recently been announced: Samuel E. Dickey, Registrar of Bonds; Robert H. Groff, Registrar of Stock; Lewis Neilson, Chief Clerk to the Secretary; Carroll M. Bunting, Chief Clerk to the First Vice-President.

Philadelphia & Reading.—At the annual meeting held in Philadelphia on May 3, officers were elected as follows: President, J. S. Harris; Treasurer, W. A. Church; Secretary, W. R. Taylor. Directors: George F. Baer, Charles H. Coster, Thomas McKean, Francis Lynde Stetson, George C. Thomas and John Lowber Welsh.

St. Louis, Mansfield & Ava Southern.—At a meeting held recently at Mansfield, Mo., the following Directors were elected for the ensuing year: T. F. Hunt, Springfield, Mo.; W. K. Hadley, Kansas City; W. D. Day and G. W. Freeman, Mansfield, Mo.; J. A. Greynolds and W. J. Turner, Ava, Mo.; C. A. Ollis, Springfield, Mo.; Lewis Mayers, St. Louis, Mo., and H. F. King, Harrison, Ark.

Southern.—The following appointments took effect May 1: E. Ryder, Assistant Superintendent of the First Division; W. O. Sprigg, Assistant Superintendent of the Third Division; A. Gordon Jones, Assistant Superintendent of the Sixth Division.

Staten Island Rapid Transit.—At a stockholders' meeting, held on May 5, the present Board of Directors was re-elected with the exception that J. Van Smith was elected to succeed Frank S. Gannon.

Wilmington & Northern.—At the annual meeting of the stockholders, held at Birdsboro, Pa., May 3, Directors were elected as follows: George Brooke, Charles Huston, A. L. Foster, John S. Gerhard, Col. L. Heber Smith and H. K. Kurtz. The present officers were re-elected.

RAILROAD CONSTRUCTION, Incorporations, Surveys, Etc.

Arkansas Central.—This company has been incorporated in Arkansas to build a railroad from Fort Smith, east about 40 miles, to Paris, in Logan County. It is stated that Fort Smith will give \$20,000 toward building the line, besides right of way and depot grounds. The capital stock of the company is \$600,000. The incorporators are Charles C. Goodman, Chicago; Joseph H. Larimer, Peru, Ind.; Virgil B. Bearers, Charleston, Ark.; John S. Shibley, Paris, Ark., and S. P. Day and Wharton Carnell, Fort Smith, Ark.

Atlantic & Lake Superior.—Newspaper reports during the past week announced that an agreement had been made between this company and the provincial government of Quebec, whereby the latter guarantees the interest on bonds issued to complete the road between Montreal and Gaspé; that these bonds had been sold in London and that the work of building the unfinished parts of the road, that is the unfinished sections of the South Shore road between Montreal and Chaudière, near Leirs, about 166 1/2 miles (from Lorel to Chaudière, 115 miles), with a bridge across the St. Lawrence River between Montreal and Longueuil, and the extension of the Baie des Chaleurs from its present terminus, Coplin, northeast to Gaspé, about 115 miles, would be at once begun. The facts are that while the Atlantic & Lake Superior is a bona fide company, this move in the scheme of finishing what is really an important piece of railroad is looked upon as of political significance only, made in view of the general election of the Province of Quebec, to be held May 11. It is true that the Quebec government has passed an order in council guaranteeing the interest on \$6,720,000 of bonds. The Baie des Chaleurs road is at present being operated by the Dominion government in connection with the Intercolonial. The owners of the road, the Atlantic & Lake Superior, endeavored to induce the Dominion government to guarantee the interest on an issue of bonds for finishing the line. It is

claimed that the government agreed to do so, but afterward declined, which forced the withdrawal of the bonds from the London market. The railroad entered suit against the government for \$1,000,000, which is still pending. In the meantime the Liberals came into power in Canada and negotiations were renewed without satisfactory results. The Quebec government was then appealed to with the result as stated above.

Bridgeton & Saco River.—At a recent meeting of the directors it was decided to increase the capital stock \$20,000 to extend the road from its present northern terminus at Bridgeton, Cumberland County, Me., north about five miles to Harrison. The road is 16 miles long, extending from Bridgeton Junction, on the Maine Central, north to Bridgeton.

California Southern.—This company has recently been incorporated in Arizona with a capital stock of \$1,500,000, by M. C. Marsh, James Campbell, F. R. Frost, Charles Weit, A. A. Daugherty, John T. Jones, Walter Rose, R. T. Hickon and Carl Leonhardt, of Los Angeles; W. T. Hefferan, of Yuma, and C. E. Crowley, of Phoenix, Ariz. It is proposed to build a railroad from Kramer, a point in San Bernardino County, Cal., on the Atlantic & Pacific, north about 100 miles to Ballarat, Inyo County, passing through Randsburg. It is expected that preliminary surveys will be begun at once. Randsburg, which is about 26 miles north of Kramer, is a new gold-mining camp.

Detroit & Lima Northern.—This road, which is being built as an extension to the Lima Northern, from its present northern terminus at Adrian, Mich., north 14 miles to Tecumseh, has been nearly finished, and it is expected will open for traffic May 15. The line will be operated as an independent line by the Lima Northern.

Findlay, Fort Wayne & Western.—It is reported that a preliminary survey is now being made for an extension of this road from its present Eastern terminus at Findlay, O., east about 110 miles to Akron.

Florida, Alabama & Northern.—The Secretary of State of Alabama has issued a commission to W. B. Wright, J. J. Sullivan and J. E. Hughes, authorizing them to open books of subscription for this proposed road. The line is to run from Pensacola, Fla., in a general northeasterly direction to Elba, Coffee County, Ala. The capital stock is \$50,000. The incorporators are: W. B. Wright, J. J. Sullivan, V. H. Wright, E. E. Resse, J. H. Givens and J. S. Reese, of Florida, and J. E. Hughes, of Covington County, Ala.

Gulf, Louisiana & Great Northern.—President J. J. Waitz states that nearly all the right of way from Arcadia to Alexandria has been secured for this road, about 120 miles, and that Bienville and Arcadia have each subscribed about \$50,000. The road is proposed from a point on Vermillion Bay, La., north to Fort Smith, Ark. It is said that 87 miles have been surveyed in Louisiana between Arcadia and a point on Red River near Boyce.

Kansas City & Northern Connecting.—Right of way is now being obtained for an extension of this road from its present northern terminus at Smithville, Mo., north about 15 miles to Plattsville. Grading has been begun, and it is expected that the line will be completed before fall. The road now extends from North Kansas City, north 22 miles to Smithville.

Mead Run.—This company was recently incorporated in Pennsylvania with a capital stock of \$140,000. It is proposed to build a railroad from Mt. Jewett, McKean County, Pa., in a general northwesterly direction, to a point near the mouth of Mead Run, in Hamilton Township, about 14 miles. At Mt. Jewett the road will connect with the Mt. Jewett, Kinzua & Ritterville. The names of the Directors are given in another column.

Mexican National.—Locating surveys for the extension of the Patzcuaro branch of this road from Patzcuaro to Uruapan, in the state of Michoacan, have been completed, and about four miles of road has already been built beyond Patzcuaro. It is expected that the line will be completed this year. The federal government has granted a subvention of \$5,000 per kilometer, payable on June 30 of each year, in 5 per cent government bonds. The state of Michoacan will pay the company \$160,000 in cash, in annual instalments of not less than \$12,000 per year. The extension will be about 80 kilometers (50 miles) long.

Mexican Roads.—The time for beginning surveys and construction work under the concession held by the government of Coahuila for a road from Saltillo, north to a point on the Mexican International, near Trevino, has been extended. The new contract provides that a reconnaissance survey be begun before June 25, 1898, and that construction work be begun within 18 months from June 25, 1897. During the first year of construction work, at least 20 km., and in each subsequent period of two years, at least 40 km., must be built, the entire line to be finished in seven years.

The Department of Communications has granted a new concession to Albert K. Owen for a road to extend from Topolobambo northeast to Presidio del Norte, on the Rio Grande, passing through Bocoyna, Concepcion and Chihuahua. The concession must receive the approval of Congress.

The Trevino-Garza concession of March 30, 1892, for a railroad from Trevino to the Pacific, has been re-issued to Messrs. Enrique C. Creel and Alfredo A. Spendlove, in a modified form. The new concession provides for building a road from Chihuahua or from a point on the Mexican Central south of Chihuahua, in a general westerly direction to a point on the Pacific coast in the state of Sonora. Plans for the first section of 200 km. (124 miles) must be submitted to the Department of Communications before April 13, 1898, and construction work is to be begun as soon as the plans have been approved. The road will be built in three sections, the first receiving a subsidy of \$1,400,000, the second \$1,800,000 and the third \$1,400,000. The subsidized length of line shall be 600 km. (373 miles).

Milwaukee, Benton Harbor & Columbus.—The contract for building that portion of the road from the mouth of the St. Joseph River in Michigan, south 25 miles to Buchanan, has been given to the Crouch Construction Co., and grading has already been begun at Buchanan.

Moore County & Western.—The surveys of this line, which is proposed from Craigownie, N. C., west to Concord, have been completed, and grading will probably be begun within a few days. Craigownie is the western terminus of the Moore County Railroad, which line will be used by this company for entrance to Aberdeen, connecting with the Seaboard Air Line.

Pennsylvania.—A contract has been awarded to W. G. Stahl & Sons for an extension from Williamsburgh, Blair County, on the Williamsburgh Branch of the Altoona Division, three miles to the quarry land recently

purchased by the Youngstown Iron Co. It is expected that work will be begun immediately.

Queen Anne's.—Plans are being prepared for an extension of this road from Queenstown, Md., north to Elkton, Md., via Centerville, Church Hill and Crumpton, a total of about 54 miles. The plans will be submitted to the stockholders at the coming annual meeting. I. W. Troxel, Queenstown, is General Manager.

Ventura & Ojai Valley.—Right of way for this proposed road in Southern California has been obtained, and President A. P. Cross, of Los Angeles, states that contracts are about to be let for grading. The road will extend from Ventura north about 25 miles up the Ojai Valley to Nordhoff, and thence about five miles to Hobart.

Electric Railroad Construction.

Berkley, Va.—The grading for the new electric railroad at Berkley (a suburb of Norfolk) has been practically completed. The machinery and apparatus for the road will be purchased this month.

Brooklyn, N. Y.—The Brooklyn Heights electric railroad has concluded traffic arrangements with the new Long Island electric railroad whereby the former will hereafter be enabled to run its parlor and other special cars over the lines of the latter company to Rockaway Beach, a popular summer resort, connection being made at Jamaica. The distance between the City Hall, Brooklyn, and Jamaica is about 10½ miles and from the latter point to Rockaway Beach is about 6½ miles. The Passenger Department of the Brooklyn Heights, through its General Passenger Agent, H. Milton Kennedy, has, during the past two years, given much attention to special excursion business, which has proved an important factor in advancing suburban traffic. The road proposes to run special excursions this year to Rockaway Beach, which has heretofore not been reached by an electric road from Brooklyn.

Buffalo, N. Y.—The Buffalo & Depew Railroad Co. was incorporated May 1 to operate an electric road 7½ miles long, from Cheektowaga to Lancaster. The capital stock is \$100,000. The directors include H. P. Bissell, W. B. Cutler and A. Smith, of Buffalo, N. Y.

Cannonsburg, Pa.—The Carnegie-Cannonsburg Electric Railway Co. has been incorporated to build a line from McDonald to Carnegie and Cannonsburg. It has been agreed to capitalize the company at \$250,000. A committee has been appointed to secure right of way and solicit subscriptions.

Champaign, Ill.—The Urbana & Champaign Railway, Gas & Electric Co. has been incorporated, with a capital stock of \$250,000, to operate an electric railroad and to furnish electric power. Incorporators, B. F. Harris, Jr., N. M. Harris and H. H. Harris.

Chautauqua, N. Y.—The Westfield, Mayville & Chautauqua Motor Railroad Co., of Chautauqua County, was incorporated May 3, with a capital stock of \$150,000. The company proposes to operate an electric road from the shore of Lake Erie, at Westfield, Chautauqua County to the Chautauqua Assembly grounds.

Cincinnati, O.—The Cincinnati Street Railway Co. has asked permission to lay tracks on Columbia avenue, in Cincinnati, to the village line of Madisonville, a distance of nearly six miles.

Delhi, N. Y.—The State Railroad Commissioners have granted the Monticello-Fallsburg Railroad Co. the right to build an electric road between the villages named in the title on condition that the road will be extended to the railroad station in Monticello.

Doylestown, Pa.—It is reported that the East Penn Traction Co. has contracted with Boody & Wheeler, of Philadelphia, for the construction of an electrical road between Doylestown and Trenton, a distance of 26 miles. The line will pass through Morrisville, Yardley, Newtown, Wrightstown, Pineville, Buckingham and Mechanics Valley. Double-truck, eight wheel, 34 ft. cars, with two 30-H. P. motors on each car, will be used. Work is to be commenced at Morrisville and Doylestown within two weeks.

Far Rockaway, N. Y.—The Ocean Electric Railway Co. was incorporated May 1 to build 5 miles of electric road on some of the streets in Far Rockaway. The capital stock is \$50,000. The directors include Daniel F. Lewis, Brooklyn; S. B. Lawrence, W. H. Chesebrough and H. M. Haviland, of New York.

Greenville, S. C.—The City Council has granted a 37-years' franchise to Dr. J. S. Lawrence and associates, of Greenville, to build an electric railroad in Greenville, under the conditions that the promoters will have at least five miles in operation within 12 months from date of the franchise. It is stated that the road may be extended to Paris Mountain, a popular summer resort nine miles from Greenville.

Hamilton, Ont.—The Hamilton & Dundas Railroad is being built, the new track being continued toward Hamilton, from the Aberdeen avenue bridge, where the road was left uncompleted last fall. It is understood that the Dundas Council will consider the by-law for changing the motive power to electricity.

Hampton, Va.—It is proposed to extend the Hampton, Newport News & Old Point Comfort Railroad.

Haverhill, Mass.—It is stated that the Haverhill, Merrimac & Amesbury Street Railway will be extended from Salisbury to Seabrooke and Hampton, N. H.

Hellertown, Pa.—The ordinance granting the South Bethlehem & Hellertown Trolley Company the right to lay its tracks through the borough of Hellertown has been passed by the Town Council.

Lansing, Mich.—The bill permitting the construction of an electric or steam road from Lansing to Ithaca, through St. Johns, has been reported on favorably in the House.

Mansfield, Mass.—The Mansfield & Easton Street Railway Co. has been granted a location for an electric road from Mansfield to Easton.

Monterey, Cal.—The Pejaro Extension Railway Co. has been incorporated to build an electric road in Monterey County, with a capital stock of \$100,000, of which \$10,000 has been paid in. C. Spreckels, W. C. Waters and J. L. Koster are said to be interested.

Niagara Falls, Ont.—A new electric railroad Company has been formed, composed of H. C. Symmes, R. Paine and others, to build a line which will connect with the Niagara Falls, Park & River Railway, and extend to the Lundy's Lane battle ground.

Pittsburgh, Pa.—The necessary \$50,000 for the extension of the lines of the Consolidated Traction Co. into the Squirrel Hill District, has been subscribed.

Portsmouth, Va.—The Pennsylvania capitalists who have purchased the horse-car line from the Portsmouth Street Railway Co., propose to convert it into an electric road at once.

St. Louis, Mo.—The St. Louis, Fenton & Southwestern Railway Co., which secured a franchise March 10, as mentioned among these notes of March 26, has filed a petition for the release of certain conditions upon which the franchise was granted. The company now objects to paying 1 per cent. of the gross earnings of the road for 20 years and 2 per cent. the next 15 years, and it desires the sum of \$5,000 be reduced \$1,000 when the road is completed. It further desires that the term of the franchise be extended to 50 years.

Scranton, Pa.—An ordinance has been introduced in Select Council granting franchises to the Scranton Traction Co. for important extensions on the west side.

Sunbury, Pa.—The Sunbury & Northumberland Electric Railway Light & Power Co. has elected the following officers: President, Daniel Coolidge; Secretary, C. M. Clement; Treasurer, S. P. Wolverton.

Washington, D. C.—A site has been secured in Anacostia for the power-house for the Capital Railway Co. Construction work on the building will begin in a short time.

Wheeling, W. Va.—The Wheeling & Elm Grove Railway Co. has petitioned the Council to grant the company permission to extend its road within the city limits.

Windsor, Ont.—Surveys are being made for the electric railroad from Amherstburgh to Windsor, the plans for which have been filed in Toronto.

GENERAL RAILROAD NEWS

Atchison, Topeka & Santa Fe.—The earnings for March and for the nine months ending March 31 were as follows:

	1897.	1896.	Inc. or Dec.
Gross earn.....	\$2,543,470	\$2,274,663	I. \$268,807
Oper. expen.....	2,000,636	1,749,007	I. 251,629
Net earn.....	\$542,834	\$525,656	I. \$17,178
Taxes and rentals.....	150,409	150,022	D. 387
Inc. from oper.....	\$387,425	\$375,634	I. \$11,791
Nine months:			
Gross earn.....	\$23,160,678	\$22,377,641	I. \$783,037
Oper. expen.....	16,704,481	16,917,151	D. 212,670
Net earn.....	\$6,456,197	\$5,460,490	I. \$995,707
Taxes and rentals.....	1,425,592	1,453,794	D. 28,202
Inc. from oper.....	\$5,030,605	\$4,006,696	I. \$1,023,909

Atlantic & Pacific.—The Western Division, extending from Atlantic & Pacific Junction, 12 miles west of Albuquerque, N. Mex., to the Needles, Cal., 505 miles, was sold at Gallup, N. Mex., May 3, under foreclosure of the first mortgage, and was purchased by a committee acting in the interest of the Atchison, Topeka & Santa Fe. The purchasers will proceed to wind up the receivership as rapidly as possible, and take control of the property. This transaction was made possible through an arrangement made with the first mortgage bondholders' committee of the Atlantic & Pacific in January last, whereby the Atchison bought the committee's holdings of bonds. The sale wipes out the junior securities, some \$14,000,000 of bonds and \$80,000,000 of stock. By the purchase the Atchison increases its fixed charges about \$400,000. This property has heretofore failed to earn its own fixed charges (including rental of the Mojave Division), but shows a surplus (net earnings) of \$447,042 in 1896, and will show a considerable increase for 1897 over 1896, so that the purchase at the price named may be considered an advantageous deal for the Atchison, aside from the value of the line in affording a necessary connection between the parts of the Atchison system. An agreement has been made with the Southern Pacific whereby the Atchison is to secure ownership of the remaining portion of the road, 249 miles from the Needles to Mojave, Cal., now opened under lease from the Southern Pacific. When the receivership is terminated the road will be consolidated for operating purposes with the Southern California line of the Atchison.

Atlantic Coast Line.—The last Legislature of South Carolina granted a charter consolidating the Wilmington, Columbia & Augusta, the Northeastern of South Carolina, the Cheraw & Darlington, the Central of South Carolina, the Manchester & Augusta and the Florence railroads, provided none of the lines named were parallel or competing. A test case was decided in favor of the company on April 27, and steps will now be taken to consolidate these roads into one corporation. The total length of line affected is about 550 miles.

Brooklyn Elevated.—The plan of the Reorganization Committee, of which F. P. Olcott is Chairman, made March 19 last, has been approved, 81 per cent. of the various issues of bonds provided under the plan having been deposited with the Central Trust Co.

Burlington, Cedar Rapids & Northern.—The annual report of this company to Dec. 31, 1896, shows:

	1896.	1895.	Inc. or Dec.
Gross earn.....	\$4,450,035	\$4,044,332	D. \$405,703
Oper. expen.....	3,366,731	3,046,960	I. 319,771
Net earn.....	\$1,083,304	\$1,457,372	D. \$374,068
Other receipts.....	28,205	49,480	D. 21,275
Net income.....	\$1,111,509	\$1,506,852	D. \$395,343
Interest.....	307,673	311,080	D. 3,407
Dividend.....	220,000	165,000	I. 55,000
Miscellaneous.....	...	13,025	D. 13,025
Surplus.....	\$38,836	514,747	D. 475,911
Balance.....	\$690,328	\$729,905	D. \$39,577

The dividend rate was increased from 3 per cent. to 4 per cent. The passenger miles were 34,238,522, an increase of 236,309; the ton miles were 297,743,766, an increase of 6,591,697. The passenger rate fell 0.014 cent to 2.559 cents; the ton-mile rate fell 0.051 cent to 1.13 cents. The President says: "The surplus of 1895 led your directors to authorize placing 10,298 tons of 80-lb. steel rails in track. All main tracks are now laid with steel. Sixty wooden bridges were replaced with permanent structures. Ballasting with gravel, cinders and stone was done on 55 miles of track. Two hundred and twenty-one thousand oak and 147,000 cedar ties were placed in track. The great decrease in the price of steel rails has induced your directors to order for 1897, 8,500 tons. Two hundred stock cars, four switch engines and three passenger engines have been added to the equipment, the cost of which is charged to operating expenses. It will not be necessary to purchase any more cars for this year."

Canadian Pacific.—The earnings for March and for the three months ended March 31 have been reported as follows:

March:	1897.	1896.	Inc. or Dec.
Gross earn.	\$1,528,945	\$1,503,603	I. \$25,342
Oper. expen.	1,008,732	1,027,072	D. 18,340
Net earn.	\$520,213	\$476,531	I. \$43,682
Three months:			
Gross earn.	\$1,113,963	\$5,393,657	D. \$1,189,694
Oper. expen.	2,832,584	3,927,444	D. 1,104,860
Net earn.	\$1,281,379	\$1,336,213	D. \$54,834

Chesapeake & Ohio.—The earnings for March and for the nine months ending March 31 have been reported as follows:

March:	1897.	1896.	Inc. or Dec.
Gross earn.	\$1,036,553	\$812,700	I. \$223,853
Oper. expen.	753,387	543,986	I. 209,401
Net earn.	\$283,166	\$268,714	I. \$14,452
Nine months:			
Gross earn.	\$8,089,339	\$7,738,800	I. \$350,539
Oper. expen.	5,437,022	5,277,551	I. 159,471
Net earn.	\$2,652,017	\$2,461,249	I. \$190,768

Chicago, Burlington & Quincy.—The earnings for March and for the three months ending March 31 were as follows:

March:	1897.	1896.	Inc. or Dec.
Gross earn.	\$2,995,739	\$2,712,142	I. \$283,597
Oper. expen.	1,642,011	1,675,768	D. 33,757
Annual charge.	890,000	881,107	I. 8,893
Net earn.	\$1,663,728	\$1,555,267	I. \$108,461
Three months:			
Gross earn.	\$8,437,829	\$7,901,162	I. \$536,667
Oper. expen.	4,846,114	5,122,632	D. 276,518
Annual charges.	2,670,400	2,643,321	I. 26,679
Net earn.	\$921,715	\$138,209	I. \$783,506

Erie.—The earnings for March were as follows:

March:	1897.	1896.	Inc. or Dec.
Gross earn.	\$2,455,706	\$2,489,073	D. \$33,367
Oper. expen.	1,898,183	1,869,370	I. 28,813
Net earn.	\$557,523	\$619,703	D. \$62,180

Louisville & Nashville.—The earnings for March and for the nine months ended March 31 have been reported as follows:

March:	1897.	1896.	Inc. or Dec.
Gross earn.	\$1,691,952	\$1,500,950	I. \$191,002
Oper. expen.	1,175,366	1,119,755	I. 55,551
Net earn.	\$516,586	\$381,195	I. \$135,391
Nine months:			
Gross earn.	\$15,458,213	\$15,606,119	D. \$147,906
Oper. expen.	10,387,985	10,663,020	I. 275,035
Net earn.	\$5,070,228	\$4,943,099	I. \$127,129

Mexican Central.—A sale of \$500,000 20-year five per cent. equipment bonds of the company has recently been made in London. The bonds will be secured by a mortgage of the equipment and by a deposit in trust of \$750,000 of the company's general four per cent. bonds. The fixed charges on account of the bonds will be \$50,000 a year, one-half interest and the balance principal. The company has recently ordered 21 locomotives and 635 cars, which are to be paid for out of the proceeds of the sale of bonds.

New York Central & Hudson River.—A bill was passed by the Legislature of the State of New York shortly before its adjournment, and on Tuesday of this week was signed by Governor Black, which was designed to facilitate the proposed refunding of the debt of the New York Central and the Harlem railroads. The general scheme of refunding was mentioned in our columns of April 23, page 292. It is designed to reduce the fixed charges by about \$1,500,000 per annum.

Northeastern of Georgia.—M. H. Dooley has been appointed Temporary Receiver for this road, which is now operated under lease from the state of Georgia by E. A. Richards & Co., of New York, at an annual rental of \$18,000. A hearing for the appointment of a permanent receiver has been set for May 15 at Lawrenceville. The road will be sold on June 24 by Governor Atkinson under a special act of the Georgia Legislature. The upset price will be \$387,000, the amount of the state bonds on the road. The road, which was purchased by the state in April, 1895, extends from Athens north to Lula, 140 miles.

Philadelphia & Reading.—The earnings for March and for the four months ending March 31 have been reported as follows:

March:	1897.	1896.	Inc. or Dec.
Gross earn.	\$1,548,482	\$1,594,369	D. \$45,887
Oper. expen.	924,114	970,772	D. 46,658
Net earn.	\$624,368	\$623,597	I. \$771
Four months:			
Gross earn.	\$6,291,727	\$6,591,394	D. \$299,667
Oper. expen.	3,603,678	3,951,451	D. 347,773
Net earn.	\$2,688,049	\$2,639,943	I. \$48,106

Seattle, Lake Shore & Eastern.—Judge Hanford, in the U. S. Circuit Court at Spokane, Wash., recently granted a decree of foreclosure in the suit of the American Loan & Trust Co. against this company, the Union Depot Co. and the Washington & Idaho Railroad Co., to recover \$500,000. It was shown that default had been made in the payment of interest on the mortgage covering the terminal property at Spokane. The decree allows for a redemption by the defendant companies before Sept. 1, 1898, and provides that no order of sale shall be issued prior to that date. The companies have been in the hands of receivers since Sept. 1, 1894.

Silverton Northern.—This road, which has been closed during the winter months on account of deep snows, was reopened on April 27. The road extends from Silverton, Col., north 10 miles to Eureka and is narrow gauge.

Southern Pacific.—The earnings of the whole system for March and for the nine months ending March 31 have been reported as follows:

March:	1897.	1896.	Inc. or Dec.
Gross earn.	\$3,913,511	\$3,741,885	I. \$171,626
Oper. expen.	2,674,578	2,706,169	D. 31,591
Net earn.	\$1,238,933	\$1,035,716	I. \$203,217
Nine months:			
Gross earn.	\$37,419,155	\$38,760,027	D. \$1,340,872
Oper. expen.	23,765,811	24,778,214	D. 1,012,403
Net earn.	\$13,653,344	\$13,981,813	D. \$328,469

South Side Elevated (Chicago).—The Illinois Trust & Savings Bank has decided to buy \$750,000 of the \$1,500,000 of 4½ per cent., 10-year bonds of this company

and a special meeting of the stockholders has been called for June 24 to ratify the transaction and to formally authorize the issue of the bonds. These bonds will be guaranteed by a mortgage on the entire property of the company. No more will be sold at present, the balance being held in the treasury for future extensions and improvements.

Texas, Louisiana & Eastern.—The Atchison, Topeka & Santa Fe has purchased the road, now built from Conroe, Tex., to a point seven miles beyond Springer, Tex., 30 miles, and on May 1 the property was turned over to the Gulf, Colorado & Santa Fe, by which road it will hereafter be operated. The line runs through one of the best timber tracts of Texas and will prove a valuable feeder to the Atchison.

Union Pacific.—The Union Pacific system reports for the year ended Dec. 31:

	1896.	1895.	Inc. or Dec.
Gross earn.	\$23,179,473	\$22,477,823	I. \$701,650
Oper. exp.	14,784,909	14,088,793	I. 696,116
Net earn.	\$8,394,564	\$8,389,030	I. \$5,534
Taxes.	1,023,929	1,151,184	D. 127,255
Balance.	\$7,370,635	\$7,237,846	I. \$132,789
Other income.	1,347,946	1,739,111	D. 391,165
Total income.	\$8,718,586	\$8,946,977	D. \$228,391
Total charges.	10,611,911	10,181,812	I. 430,099
Deficit.	\$1,893,325	\$1,234,835	I. \$658,490

The gross earnings per mile of road were \$4,718 in 1896, against \$4,610 in 1895; operating expenses, including taxes, \$3,185, against \$3,081; net earnings \$1,533, against \$1,528. Gross earnings per revenue train mile were \$1.85, against \$1.75; net 60 cents, against 58 cents. Passengers carried numbered 1,717,638, increase 16,608; passengers one mile 165,076,137, decrease 4,240,355; freight tons 4,707,907, increase 486,288 tons; tons one mile 1,511,212,788, increase 44,789,002 tons; earnings per passenger per mile 2.351 cents, against 2.265 cents; earnings per ton-mile 1.035 cents, against 1.031 cents. Average number of freight cars hauled in each freight train 26.53, against 25.96; average number of tons of freight hauled in each freight train 206.78, against 195.58.

Wabash.—The earnings for March and for the nine months ended March 31 have been reported as follows:

March:	1897.	1896.	Inc. or Dec.
Gross earn.	\$336,147	\$1,002,363	D. \$666,216
Oper. expen.	612,901	691,197	D. 78,296
Net earn.	\$323,536	\$311,166	I. \$12,370
Nine months:			
Gross earn.	\$3,768,414	\$9,883,333	D. \$6,114,919
Oper. expen.	6,073,935	6,914,299	D. 840,364
Net earn.	\$2,694,479	\$2,969,034	D. \$274,555

Wyoming & Northwestern.—A trust deed from this proposed railroad in Wyoming to the Chicago Title & Trust Co. and H. W. Leman has been filed for record at Casper, Wyo. The deed secures the Title & Trust Company and Mr. Leman in the sum of \$1,500,000 in selling bonds to build the road from Casper, Natrona County, the present western terminus of the Fremont, Elkhorn & Missouri Valley, west about 60 miles to the western border of Natrona County.

Electric Railroad News.

Bridgeton, N. J.—The reorganization of the South Jersey Traction Co., which was recently sold, took place on May 3, and the corporation will hereafter be known as the Bridgeton & Millville Traction Co. The following officers have been elected: Directors, C. H. Kuhn, Stephen Green, Aaron Fries, H. H. Minch, Lawrence Johnson, Frank S. Lewis and Walter H. Bacon. C. H. Kuhn was elected President, S. Greene Vice-President and W. H. Bacon Secretary and Treasurer.

Brooklyn, N. Y.—The gross earnings for the roads of the Brooklyn Rapid Transit Co. are given as follows:

Month of April:	1897.	1896.
Brooklyn Heights	\$37,742	\$380,288
Brooklyn, Queens Co. & Suburban	6,812	59,647
Total	\$139,554	\$139,915
Ten months, ending April 30:		
Brooklyn Heights	\$3,734,361	\$1,598,982
Brooklyn, Queens Co. & Suburban	602,641	568,443
Total	\$4,336,995	\$1,167,425

Knoxville, Tenn.—Bondholders representing \$25,000 of the bonds of the Johnson City & Carnegie Street Railway Co. have asked that a receiver be appointed for that company.

Pottsville, Pa.—A settlement of the equity suit of minority stockholders against the Schuylkill Electric Railway Co. has been made, the defendants purchasing the stock of the complainants and paying the costs.

TRAFFIC.

Traffic Notes.

The passenger service of the Providence Line steamers between New York and Providence will be resumed on Monday, May 10.

The American Warehouse Men's Association of New York City has complained to the Interstate Commerce Commission that the Trunk Line railroads discriminate between shippers in granting free storage on flour for long periods of time.

The roads leading from the Alabama iron district have made a reduction of about 20 per cent. in the rates on pig iron to points on the Ohio River and north of there. A reduction of about 5 per cent. has been made in the local rates on ore, coal and limestone.

C. H. Griffin, Agent of the Western Railway Weighing Association, and of the Utah Railway Association, has been appointed Commissioner of the Utah Demurrage Association, at Salt Lake City. The Demurrage Association has heretofore been under the control of Mr. Hill, Commissioner of the Denver Bureau.

The Railroad Commissioners of North Dakota have decided upon freight tariffs for the railroads of the state, and the preparation of the lists is now going on. A press dispatch says that the rates per mile will be the same in all parts of the state and will probably be about 10 per cent. less than those now in force.

The Managers of the Joint Traffic Association have issued a circular making more stringent restrictions in the matter of cartage allowances on import freight at Atlantic ports, which are absorbed by the railroads. Such charges must be absorbed only when the freight is actually carted by carts, drays or wagons, and no

allowance must be made for transfer by hand trucks or by hand labor, nor in any case where the property is transferred only from one part to another of the same pier or bulkhead, or between a pier and an adjoining bulkhead.

The railroads of the Southern states met in Washington on April 28 and practically agreed upon the articles of organization of a passenger association. Henry Walters, of the Atlantic Coast Line, was chosen President of the association and Joseph Richardson, Commissioner of the old association, was elected Chairman of the Conference Committee, which is the principal working board of the new association. On the following day a new organization for the freight department was adopted, Major J. W. Thomas, of the Nashville, Chattanooga & St. Louis, being made Chairman of the Executive Board. The Chairman of the association, who is the active manager, is Mr. Samuel F. Parrott, formerly General Manager of the Columbus Southern.

The Southern Pacific Company reports the total transcontinental freight traffic eastbound for March as follows:

From:	To:
San Francisco	18,659
Oakland	1,724
Sacramento	5,385
San Jose	1,522
Stockton	317
San Joaquin Valley	2,933
Marysville	1,517
Portland	1,159
Total	32,856
In 1896	28,899
Increase	3,957

The March business was 13,000 tons larger than in February. Nearly 25 per cent. of the increase for March was in fruits.

Indictment of Southern Pacific Officers.

The Interstate Commerce Commission since the hearing held by it in New Orleans, has secured the indictment of four officers of the Southern Pacific for violations of the Interstate Commerce law. These officers are: Third Vice-President, J. C. Stubbs, of San Francisco; Second Assistant to the President and Comptroller, William Mahl, of New York; Traffic Manager, C. N. Bein, of Houston, and General Freight Agent, H. A. Jones, of Houston. The charges relate to alleged illegal rebates to Steinhardt & Co., of New Orleans, on cotton seed meal in 1894 and 1895 and to Nash & Co., of Waco, Tex., on lumber in 1895. It is said that the information on which the indictments are based was given to the Commission by the General Auditor of the Atlantic Division of the Southern Pacific, when it was demanded of him several months ago. The indictments were found in the United States Circuit Court, Judge Pardee. This is the judge who fined two Texas & Pacific officers \$4,000 each for illegal rate-cutting.

Freight Rates on Lumber in Wisconsin.

Lumber rates into Illinois from Wisconsin points have been reduced on an average of two cents by the Chicago, Milwaukee & St. Paul, Chicago & Northwestern and Wisconsin Central railroads, which is equivalent to 50 cents a thousand on the value of lumber; and the Chicago, Milwaukee & St. Paul has made a seven-cent rate from Menominee to Chicago to meet the competition of the car ferry. The Wisconsin local tariff has also been reduced from 1½ to three cents. The Wisconsin Valley lumbermen have at last obtained what they have sought so eagerly for a great many years—a 10-cent rate to Illinois. They may thank the Wisconsin Valley Lumbermen's Association for the result. If it had not been for the persistency of the freight committee in demonstrating to the railroad the justice of its claims, assisted by the competition of the car ferry, it is not likely that the rates would have been reduced. The railroad managers were told that conditions had changed in the last 13 years, the time when the Bogue differentials were created. At that time Wausau was the northernmost lumber point. Ashland had not been thought of, neither had the other northern markets which now ship a large quantity of lumber. Minneapolis is a bigger market than the Wisconsin Valley and has an advantage so great that the valley can't ship a board across the Mississippi River. The roads out of Minneapolis do not originate lumber traffic; they depend on what they can pick up and as everything is clear gain, they can afford to cut the rate, and they do. The yellow-pine interests have also cut into the valley trade. At the time the Bogue differentials went into effect everybody used to laugh at the idea of yellow pine cutting any figure in competition with white pine. Now yellow pine goes as far north as Madison on the Chicago rate. Pacific coast shingles have come in by the fostering care of the railroads, and have practically compelled the lumbermen to burn up the stuff they otherwise would put into shingles. . . . This is only the entering wedge. An effort is being made to secure a reduction of rates into Indiana, Iowa, Missouri, Nebraska and Kansas. The fact that the lumbermen have stood together in their association is the keynote of the victory. Had they gone at the work by their former method of passing resolutions, they would not have accomplished much.—*Northwestern Lumberman.*

Eastbound Shipments.

Eastbound all-rail shipments from Chicago and Chicago Junctions to points at and beyond the Western terminus of the trunk lines for the week ending April 29 amounted to 60,778 tons, as compared with 65,782 tons the preceding week. This statement includes 19,921 tons of grain, 5,219 tons of flour and 11,101 tons of provisions, but not live stock. The following is the statement in detail for the two weeks:

Roads.	WEEK ENDING APRIL 29.		WEEK ENDING APRIL 22.	
	Tons.	p. c.	Tons.	p. c.
Baltimore & Ohio	3,700	6.1	4,628	7.0
C. & C. & St. Louis	2,547	4.2	4,602	7.0
Erie	8,613	14.2	7,184	10.9
Grand Trunk	2,968	4.9	5,370	8.2
L. S. & M. S.	9,531	15.7	10,632	16.1
Michigan Central	9,116	15.0	10,040	15.3
N. Y., Chi. & St. L.	6,035	9.9	5,576	8.5
Pitts., Cin. & St. Louis	7,200	11.8	4,976	7.6
Pitts., Ft. Wayne & Chicago	7,656	12.6	8,560	13.0
Wabash	3,412	5.6	4,214	6.4
Totals	60,778	100.0	65,782	100.0

Lake shipments for the week ending April 28 amounted to 48,128 tons.